WESTERN AMERICAN ALPINES

GABRIELSON

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WESTERN AMERICAN ALPINES

Western American Alpines

BY

IRA N. GABRIELSON

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FOREWORD

There are seven stages in the life of a gardener: First, the awakening of the realization that a flower is beautiful; second, the desire to possess flowers; third, the feeling that one must grow them and learn the rudiments of plant-cultivation; fourth, the joy that comes with early success; fifth, the despair when we are defeated by a plant or plants and the knowledge is forced upon us that one life is too short to encompass even a tithe of all there is to know about the cultivation of plants; sixth, the decision to follow one particular branch of horticulture; seventh and last, the arrival of the full-grown specialist in that particular branch.

Some fall by the wayside and fail to pass the fifth stage, but for those who reach the sixth and seventh stages there is a parting of the ways: some will specialize in trees and shrubs, others in stove-plants and orchids, a third group in peonies, and a fourth in irises, and so on; while a large proportion take up what for want of a better term is called rock-gardening. The term is really a misnomer, because a large proportion of alpine plants are not saxatile or growers on rocks. It is a good rule that for every cubic foot of rock showing above the surface there should be at least three cubic feet buried out of sight. Rocks and stones below the surface of the soil add one of the essentials for the cultivation of most alpine plants, efficient drainage; they also provide what is almost

equally important, a cool root-run. That is why the terms cultivation of alpine plants and rock-gardening have become synonymous.

The growing of alpines is one of the most satisfying of all branches of horticulture. No matter what may be the size of the garden, there is always room for some alpine plants. There is at hand the whole floral world in miniature, and in the cultivation of this miniature flora it is skill and experience that count. No textbook can lay down hard-and-fast rules for the upbringing of alpines, for every rule can be pulled in pieces if only the gardener is keen enough and has the patience to experiment. A friend in England breaks every rule in the alpine calendar. He has a hot garden with very little shade; he has no picturesque and natural rockwork; he has no running water; he grows all his plants in narrow beds with an adequate addition of stone for drainage; and yet there is nobody in our country who can grow alpines and produce such an amazing wealth of blossom as he can.

Among his specialties are alpines from the western states of the United States, and it was in his garden that I first realized the great wealth of flower treasures that exist in the main and subsidiary masses of the Rocky Mountains and in such outlying ranges as the Olympics and Cascades. Few dwarf plants are so free flowering as your alpine Phlox or Pentstemon, few so quaint as the Dodecatheons, and none so graceful as the Erythroniums. Both in the United States and in Europe our appetites have been whetted by what has appeared in the past, and we long for

more of what the western states can give us, wondering somewhat that American gardens in general have, seemingly, less acquaintance with them than have ours in Europe.

It seems to me that Mr. Ira N. Gabrielson is providing what everybody wants in giving us this volume on "Western American Alpines" out of his great store of knowledge. It is a blessing that he is a field-worker as well as a gardener, and that he is no armchair botanist. The gardening world has to bear some of the brunt of their labors and their favorite pastime of hair-splitting. You in the United States, and Germans, perhaps, have to suffer more than most from the multiplication of species which makes the choice so difficult for the gardener. I give you as examples your Cratægus, Œnotheras, and Pentstemons. But Mr. Gabrielson will have no hair-splitting: he has the great gift of being able to judge in the wild the garden value of a plant, which makes his knowledge so invaluable to the cultivator. He never hesitates from stating his candid opinion of a plant's beauty and possibilities in the garden, and I, for one, am perfectly content to abide by his judgment.

E. H. M. COX

Editor, *New Flora and Sylva*
London, England

PREFACE

Since David Douglas visited the Pacific Coast of America in 1824, collecting seeds and plants, some of which established themselves in English gardens, there has been an interest in the use of western plants for garden purposes. Until comparatively recent years, however, that interest has been rather spasmodic in America; in fact, it is easy to believe that more western American plants, particularly alpines, are grown in English gardens than in this country.

It is a curious fact that European alpines, and even some of those from the remote parts of China and the most isolated sections of the Himalayas, are more familiar to the alpine enthusiasts of the Atlantic Coast than those of the comparatively near and accessible Rockies and Cascades. This is partly due to the brilliant and untiring work of a long line of able English collectors and explorers in those remote regions, and, partly because of the absence of such enthusiasts in our own country. As a result our own alpine flora has, in large part, remained unknown to American gardens. Purdy in California and Andrews in Colorado have made the flora of their respective areas more widely known with each passing year, but there have been no outstanding men of equal ability working in the great mountain territory to the northwest. This little book is an attempt to fill the gap in our garden knowledge of the alpine plants of that territory.

Because of space limitations, all annuals and biennials, as well as larger shrubs, are omitted from this book. Only true alpines, rock and desert species, and woodlanders dwarf enough to be valuable in rock-gardens, are discussed.

Even thus reduced, the list of species, many of unknown garden value, seems endless. No one person is yet capable of writing from experience regarding all of them. This book is limited to a discussion of such plants as are known to me through personal experience, and certain others which seem outstanding enough in possibilities to warrant comment. Under this plan, doubtless, many species are omitted which more experience will prove should have been included.

No botanical keys are provided. The ordinary technical works on western plants will supply those needs. The generous number of illustrations will assist the gardener more in understanding the habits and possibilities of the plants than any practical amount of botanical description.

Technical terms have been kept to the minimum, but it is assumed that the average reader of this book will understand the meaning of ordinary words used in describing shapes of leaf and flower. Glossaries of such terms are found in many standard botanies, and a consistent effort has been made to use such necessary words in their most commonly accepted sense. No attempt has been made to participate in purely botanical discussions or disputes. The names used are those by which the plants have come to be known.

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the use of material published by them on Phlox as well as several illustrations. *Country Life in America*, *The American Home*, *Sunset*, and *Better Homes and Gardens* have also courteously given permission to use suitable illustrations from among those published by them. Prof. M. E. Peck has helped greatly in many ways in the preparation of this book. Photographs have been furnished by several, proper acknowledgments being made with each reproduction. Dr. J. Horace McFarland and Mr. G. A. Stevens have also given a great deal of encouragement and kindly criticism. To all of these, as well as many others whose friendly help has made this book possible, I hereby express my thanks and appreciation.

IRA N. GABRIELSON

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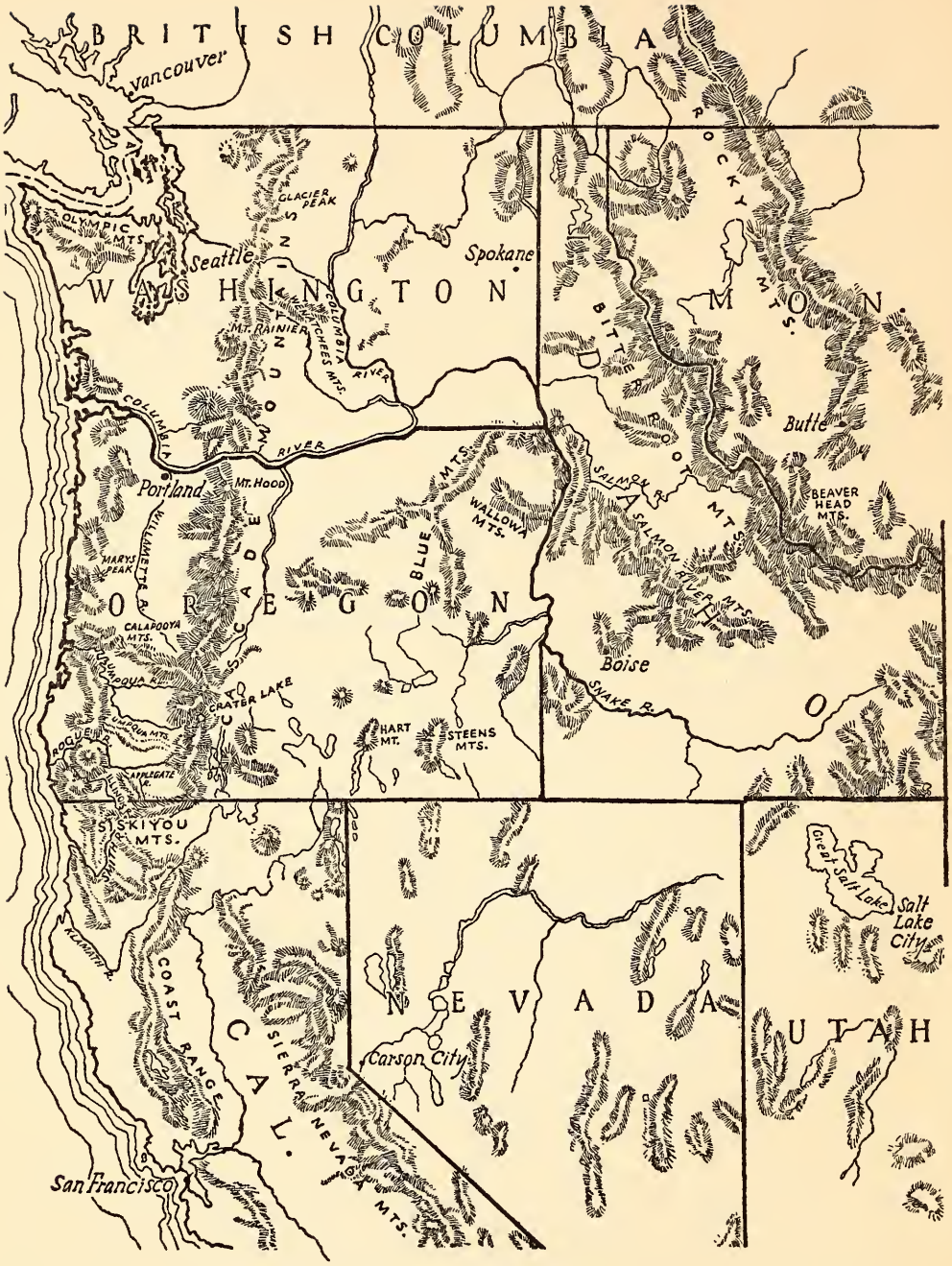


The Land of the Alpines

WESTERN AMERICAN ALPINES

CHAPTER I

THE LAND OF THE ALPINES

PAUL BUNYAN, generally credited in northwestern woodsmen's legends with having an active hand in the building of this great expanse of country, must have been in a boisterously playful mood when it was under construction. Everything is on a scale so huge that it is almost unimpressive at first sight. The country is rough and rugged. Everywhere are giant mountain ranges, tremendous canyons, precipitous cliffs, and endless deserts and plateaus. In the great intermountain country, vast flat valleys and plateaus intervene, but there are few spots where the horizon is not broken by the jagged crest of some towering range.

In general, the territory covered by this book extends from the Rockies to the Pacific, and from British Columbia and Alberta south to northern California and Colorado.

The general topography of the entire region is dominated by three major mountain ranges which more or less completely merge into one gigantic series of ranges in northern British Columbia.

The Coast Range is comparatively low in Oregon, the highest point (Mary's Peak) reaching 3,960 feet. This range is pierced by the box canyons of several

rivers and thus broken into sections. Beginning at the south, it is cut by the Rogue, the Umpqua, and the mighty Columbia. North of the Columbia it culminates in the massive Olympics, which tower far above timberline and have thousands of acres of alpine screes and meadows to furnish homes for true alpine plants.

This range is well watered and heavily timbered throughout, where fire or man has not removed the forest cover. It is a region of heavy rainfall and consequently exuberant vegetation. The great forests of spruce and fir are often so grown with a tangled mass of ferns, devil's club, vine maple, and other undergrowth that it is as impassable as any tropical jungle.

True alpine plants are few in this range until the Olympics are reached. There we come upon acres and acres of the false heathers, *Phyllodoce empetriformis* and *Cassiope mertensiana*, while the cliffs and screes above are sprinkled with choice alpines, some of which are found only in this isolated region. The prize of them all, so far, is, without a doubt, *Campanula piperi*, but Lewisia, Douglasia, Erigeron, Aster, Spiræa, Potentilla, Saxifraga, and countless other genera, are well represented.

My one early spring trip into this region is still a delightful memory of acres of avalanche lilies (*Erythronium montanum*) dancing in the breeze,* of my first glimpse of *Trollius laxus* in full flower, of Caltha filling the swamps with white and gold faces; and last, but not least, of the stately forests of Sitka spruce (*Picea sitchensis*), gloomy and awe-inspiring, with the per-

*See page 5.

petual twilight of the forest floor faintly scented by the perfume of the elfin blossoms of *Moneses uniflora*, the little single-flowered Pyrola.

In these Coast mountains, *Linnæa borealis*, *Vancouveria hexandra*, and *Clintonia uniflora* are common ground-covers. The dainty lavender slippers of *Calypso bulbosa* are common. Smilacina and Disporum are everywhere among the ferns, while in Oregon *Oxalis oregana* forms mats covering many square yards of ground. On the alpine summits there are plants that do not differ materially from those of the higher and more imposing Cascades to the eastward. Plants from these mountains are almost without exception accustomed to somewhat acid surface conditions, due to the great accumulations of forest duff.

Roughly paralleling the Coast Range one hundred miles to the eastward are the Cascades, the dominant topographic feature between the Pacific and the Rockies. In Oregon and southern Washington this range consists largely of basaltic lava, through which have surged later and lighter colored lavas to form the series of huge isolated volcanic cones which begin with Mount Rainier on the north and end with Lassen in California. North of Rainier, granites and other sedimentary rocks become more dominant and the character of the mountains more nearly resembles the Rockies.

In general, the western slope of the Cascades is heavily timbered with forests of giant trees in which Douglas fir (*Pseudotsuga taxifolia*) is the dominant form. This is a region of heavy rainfall and dense

undergrowth up to approximately five thousand feet. Here lodgepole pine (*Pinus contorta*) makes its appearance. The eastern slope carries great, open, park-like forests of yellow pine (*Pinus ponderosa*), whose columnar yellow trunks frame the endless vistas that are part of the fascinating forest pictures of the great West. In southern Oregon the decreasing rainfall allows the pines to creep over to the western slope, where the dominant yellow pine mingles with the huge-coned sugar pine (*Pinus lambertiana*) gradually merging into oak forests which give way to the mixture of Arctostaphylos and Ceanothus brush, known locally as chaparral, as the valleys are approached. The summit of the range is clothed in dense forests of spruce and fir, with only occasional points projecting above timberline. The yellow pine forests are dry and not particularly rich in small flowering plants, though an assortment of Pentstemons, Eriogonums, Phlox, and others of like character flourish. The rock-garden prize from the yellow-pine district is the dwarf creeping *Ceanothus prostratus*, widely known as Mahala mat or squaw-mat.

On rocky cliffs near the summit are Pentstemons, particularly *P. cardwelii*, *P. menziesii* in some of its numerous forms, and *P. rupicola*, various Erigerons, Asters, Saxifrages, Phlox, and the general run of rock-plants. Meadows at or near timberline are a riot of color in July and August with Lupine, Aster, Mimulus, and Castilleja furnishing the broad masses of color, while a host of others fill in the picture. The great cloud-piercing volcanic cones furnish the major

A mountain slope sheeted with dancing Avalanche Lilies (Erythronium)
Photograph by C. L. Marshall

Dwarfed clumps of *Eriogonum umbellatum* have established themselves in the shifting pumice slopes of Mount Hood
Photograph by C. L. Marshall

part of the alpine territory in this range. Because of their peculiar soil-character, they are likely to prove a disappointment to the alpine flower-lover on first acquaintance.

Except in a few favored spots, such as the world-famous Paradise Park on Mount Rainier and the smaller but beautiful Paradise and Eden Parks on Mount Hood, flowers seem scarce. There are not many great floral displays such as most beginners expect to see, but when the list is complete the variety of alpine plants to be found on one of these peaks is astonishingly large.

These newer lava cones are composed of light lavas which are broken by weathering and glacial action into a light porous pumice sand, and the talus slopes of these peaks are largely of this material. Vegetation in general is rather scanty on the newer deposits, but it gradually acquires a mixed turf of alpine plants which offer a fine selection of individual specimens, but frequently lack the great floral displays popularly associated with alpine slopes.

In southern Oregon, the Cascade and Coast ranges are connected by three cross ranges, only one of which deserves particular mention in this book. The Calapooyas, separating the Willamette and Umpqua watersheds, and the Umpquas, which form the divide between the river of the same name and the Rogue, are not, in a floral sense, markedly different from the Cascades.

But the Siskiyous, between the Rogue in Oregon and the Klamath in northern California, are one of the

most interesting floral ranges of the West, and many most beautiful alpines are at home on their rugged peaks. In addition to being the northern limit of many California species, this geologically ancient range has developed a distinctive flora of its own.

In contrast to the usual lavas of the Cascades, the Siskiyous are composed of granites, limestones, serpentines, and other sedimentary rocks in a tangled confusion that only an expert geologist might interpret. The ridges are sharp, the soil is shallow, and the timber-cover is much more scanty than in the two ranges previously discussed. Southern slopes are usually covered with a straggling growth of timber and brush, while the northern exposures support a much heavier stand, largely of yellow pine.

In addition to a wide assortment of Phlox, Erigeron, Ledum, Pentstemon, Iris, Arabis, Delphinium, Dicentra, Viola, Brodiæa, and Calochortus, all of them including beautiful species peculiar to this range, the Siskiyous are the home of about half of the known Lewisias, including nearly all of the more showy evergreen species. *Lewisia columbiana* and *Lewisia tweedyi* are the only two not found in these mountains.

I have heard that there are over seventy species of plants peculiar to this area, which lies partly in California and partly in Oregon. My observation is that the more showy of these plants are associated with the serpentine areas. It is a botanist's and collector's paradise, a singular fact considering that the resident bird and animal population differs little from that of the Cascades except that individuals are fewer.

There are spots in little isolated valleys, particularly at the heads of the Applegate and Illinois rivers, in which it is possible to find more rare alpines in bloom than in any areas of similar size I have been fortunate enough to find in the West. Late April and early May are the best seasons in which to visit these mountains to see the greatest variety of plants in bloom, though, of course, a visitor at that time will miss some of the earlier as well as the later varieties.

East of the Cascades lies a great intermountain plateau, roughly triangular in shape, with the broad base to the south and its apex in British Columbia, where the Rockies and Cascades approach each other. From that point the Rockies swing eastward and south through Montana, Idaho, Wyoming, Utah, and Colorado, leaving in eastern Washington and Oregon, southern Idaho, Nevada, and western Utah a great expanse of comparatively flat country which lies at a general elevation varying from 2,000 to 5,000 feet. It is level only in a comparative sense, for it is broken everywhere by deeply eroded canyons cut by many rivers, including the Columbia, the Snake, and their tributaries, as well as by isolated mountain ranges and buttes.

Some of these ranges are spurs of the great Rocky Mountain system, others are isolated. In southeastern Oregon and adjacent parts of California and Nevada occurs a series of great faults in the basaltic lavas, running in a generally north-and-south direction with one steep precipitous face and one gently inclined slope up which a car could be readily driven to the

summit. The outstanding range in our territory is the Steens Mountains, whose summit is slightly under 10,000 feet, and whose eastern escarpment is a sheer basaltic cliff of 4,000 feet. Less known, but equally picturesque, is Hart Mountain, sixty miles to the west, with its sheer face to the westward. There are many others of these faults, but these two will suffice to give the general idea of the territory. The entire uncultivated area except eastern Washington is covered with a somewhat scanty growth of various species of sage (*Artemisia*) which reach the stature of small trees in favored spots at low elevations and become scattered stunted bushes of six inches or less on the higher ridges and plateaus. Willows and cottonwoods along the streams, scattered junipers on the flats and slopes, and beautiful aspen groves about the springs and meadows higher up, comprise almost the entire timber-growth on these plateaus and desert ranges.

Phlox in abundant variety, Erigerons of the usual types, but also including strange little gray-leaved shrubs which hold much garden promise, Eriogonums in bewildering profusion, Pentstemons, Œnotheras, Lewisias, Linums, and many others furnish the floral display which at times for a few brief days is spectacular. The scanty rainfall and rigorous climatic conditions of these inland ranges have produced many beautiful alpines which will some day add greatly to our garden displays. They are deeply rooted and slow of growth, so that few of them are as yet widely cultivated.

With the massive granites and weirdly carved sand-

stones of the main chain of the Rockies, my experience has been more limited than with these other ranges; but a spur crossing central Idaho, southeastern Washington, and northeastern Oregon in a general northeasterly to southwesterly direction, approaching at its westernmost point within fifty miles of the main range of the Cascades, has furnished a rich plant hunting-ground for many years.

This range, like the Siskiyous, is geologically older than the intervening Cascades, and is composed largely of granite, marble, limestone, and other sedimentary rocks, sometimes filled with lava intrusions or capped by a layer of heavy basalt of varying thickness.

In central Idaho, the Salmon River Mountains, and in Oregon the Wallowas, are the most spectacular part of the range, reaching above timberline in a bewildering maze of jagged peaks and knife-edged ridges. Elsewhere in Oregon and Washington this spur is generally known as the Blue Mountains. There the general elevation is 6,000 feet, with occasional peaks and ridges reaching to greater heights.

Near the corner of the three states where the Snake splits this range with its gigantic canyon and where every tributary has a canyon, unnoticed only because of its proximity to its greater neighbor, is some of the most spectacular scenery to be found in the United States. Towering ridges, snow-capped peaks, mile-deep canyons, and mighty precipices mingle in such wild confusion as to benumb the imagination of the beholder.

In this maze many floral treasures intrigue the collector. Entire cliffs are covered with the pale green rosettes of *Lewisia columbiana;* whole slopes glow with the soft pink of *Phlox viscida;* one entire talus slope stands out vividly in my memory, blue enough to match the sky above with the flowers of *Pentstemon venustus;* a tiny meadow by a lake, high in the Wallowas, glowing with the velvety blues of *Gentiana calycosa;* a hogback ridge whose entire surface carried a soft blue tone from the nodding croziers of *Mertensia pulchella;* miles upon miles of slopes brilliantly colored with the huge suns of *Balsamorhiza sagittata;* wet slopes glowing with the royal purple bells of *Sisyrinchium grandiflorum*, vividly contrasted with the bright yellow of *Fritillaria pudica*, or the same slopes, now dry, showing midsummer masses of yellow *Eriogonum umbellatum*, furnished with an effective blue foil of Lupine; and, most precious of all, a wet, stony slope glowing with the rich violet, fragrant flowers of *Primula cusickiana*.

In the higher reaches of the Wallowas I found my first plants of *Eritrichium argenteum*, wee and woolly, with excessively beautiful blue forget-me-nots sprinkled over their frosted surface, and deserving of all the extravagant praise that Farrer heaps upon *Eritrichium nanum*, if only the adjectives were at my command.

Here, too, *Silene acaulis* spreads its bright green mats, sprinkled with tiny pink stars, to tempt the adventurous. And here, also, is the only station I have yet found for *Saxifraga oppositifolia*, although others have reported success both in the Olympics and the Cascades of Washington.

These are some of the memories which the word "Wallowas" brings back to me, and form one of the many reasons for the high place they hold in my affections among all the mountains with which I am familiar.

In general on these ranges the timber is more open and less luxuriant than on comparable slopes of the Cascades. This makes alike for easier travel and more floral display. Timberline is at somewhat greater elevation, although this of course decreases to the north in both cases.

Regarding the main Rockies, I can add little to this discussion of the more familiar spurs, except to say that the areas in the Beaverhead Mountains on the Idaho-Montana boundary and the sections of the main range in Wyoming and Colorado which I have visited, are even more sparsely timbered than the spurs. Massive granite domes and peaks, and red sandstone ledges carved into grotesque shapes by wind and weather, dominate the landscape. Those areas, where there is any soil at all, are more evenly covered with a short turf than is general in the more western ranges.

In this turf are found an enormous number of dwarf Asters, Erigerons, Townsendias, and other composites which are the outstanding contribution of the Rockies. Not that other good rock-plants are lacking, but the Gentians, Saxifrages, Campanulas, and Pentstemons of the Rockies have counterparts in other sections, while these wide-eyed dwarf daisies in enchanting blue, white, and pink exist in such abundant variety as to make one sure he is in the original home of the tribe.

CHAPTER II

GROWING OF WESTERN ALPINES

In american gardening circles there is a steadily growing appreciation of daintiness which indicates a changing standard of garden values.

The craze for size that makes many gardeners believe that a lily or delphinium eight feet high is axiomatically more beautiful than one merely six, is still abroad in the land. And there are still many gardeners who think that a dahlia with all the grace and daintiness of a huge red sauerkraut cabbage is the acme of all floral wonders, regardless of balance of flower and foliage, carriage or color. Size is not necessarily objectionable or incompatible with real beauty but there are other elements which make a flower really beautiful and desirable.

At the other extreme are those who worship minuteness and rarity to the exclusion of everything else, but in America their number is unnoticeable among those who strive for mastodonic proportions in the flowers they grow.

The rising appreciation of alpine and rock-plants is a welcome break in gardening habits; although many crimes of ignorance and enthusiasm have been committed in the name of alpines. Huge piles of rocks erupting incongruously in the center of smooth lawns are the least of these, and the color combinations sometimes achieved must cause high merriment among the gods.

The timberline parks of massive Rainier are gay with Lupines in proper season. Photograph by C. L. Marshall

Great beds of *Phlox diffusa* adorn the July landscape on favored slopes of Mount Hood. Photograph by C. L. Marshall

There are "rockeries" of splintered granite slabs standing erect in soldierly rows as neat and orderly as a well-kept cemetery; rock-gardens made of every obtainable variety of boulder, wonderful as geological collections but dismal failures as homes for rock-plants; rock-gardens of brilliantly hued boulders that thoroughly dim the colors of some of the most beautiful flowers; and rock-gardens checkerboarded into a formal design; in fact, rock-gardens which go astray in every possible fashion from the natural idea, which is the only logical basis for that type of gardening.

One of the most prevalent misconceptions regarding rock-gardens is the belief that a pool or stream is necessary. This conception is encouraged and developed by the builders of pools and manufacturers of circulating pumps. As a matter of fact, in the western American mountains there are hundreds, yes thousands, of natural rock-gardens where water is absent, to every one in which it is present. A talus slope at the base of a precipitous cliff often provides suitable quarters for many more alpines and rock-plants than can be found along the tumbling mountain stream far below. In other words, while a pool or a rill is a beautiful thing which may be a source of great pleasure, it is neither entirely necessary nor always desirable in connection with a natural rock-garden.

A rock-garden can be the most beautiful feature of the landscape if it is fittingly located and properly constructed, but it is not an absolute necessity for those who want to grow alpine plants. Many such plants can be easily grown in any good well-drained

garden soil if raising alpine plants is the end in view. Yet the rocks give them an "at home" appearance that nothing else can.

Granting that the rockery is suitably located, its construction is a serious matter in growing rock-plants well. It is not enough to buy a few loads of stone and hire a stone-worker to place them, or merely to dump them in serene faith that everything will be all right. The construction work should be carried out by a person who understands the needs of alpine plants and provides for them.

Drainage is the first requisite of alpines as a class. In many cases the natural slope of the ground automatically provides it, but all too often this natural advantage is largely nullified by packing stiff, heavy clay about the rocks. Where such clay is present, a soil composed of rock-chips, sand, leaf-mold, and loam should be used.

With drainage provided, the next thing is an adequate water-supply. Many alpines are thirsty plants, although they may resent too much moisture. For high and fussy alpines, a scree or moraine garden is necessary, but the great majority will be satisfied in a well-watered but well-drained situation. Rocks regulate the temperature of the roots, keeping them cool in summer and warm in winter. They also help control the amount of moisture in the soil.

Manure or other fertilizer should be used sparingly, if at all, although the popular belief that manure is fatal is not entirely true. But manure does often ruin their chief charm, compactness. Alpines attain

their dwarfed appearance by shortening their stems, and fertilizer tends to lengthen them again, changing them into floppy, untidy masses instead of compact domes.

Western American alpines may be roughly divided into three classes so far as the soil conditions in which they grow are concerned.

Almost all those of the Coast and Cascade ranges are acid-loving, or at least acid-tolerant. Both ranges are heavily timbered and covered with abundant duff from coniferous trees, except above timberline where the soil is composed largely of lava with an acid reaction.

The Rockies and related ranges are metamorphic rock, with granite predominating, but sandstones, limestones, slates, and others appear in extensive outcrops. The Siskiyous make a similar isolated group, and the preferences of plants from either region may vary, although the great majority are not lime-loving species.

The great interior basin is largely composed of basaltic lava, sometimes piled thousands of feet deep. It is a semi-arid region of scanty rainfall and extensive shallow lakes, nearly all of which become dry at irregular intervals. Many of these lakes are intensely alkaline, due to the abundance of sodium and potassium salts. Plants from these areas often require lime in the western Oregon country, but should be easily suited in middle-western gardens where lime is more commonly present.

My own experience with many alpine plants, both

European and American, has convinced me that the importance of acid or alkaline soil reaction has, as Mark Twain said concerning the report of his own death, been greatly exaggerated. The great majority of alpines will thrive in neutral soil, or in soil either slightly acid or alkaline. Only where the acid or lime content, as the case may be, is extreme may it be harmful to most plants. Nevertheless, some species do have very definite soil-preferences. In any event, it is safe to assume that the western plants are tolerant of moderate acidity, and may be treated accordingly unless contrary information is available.

Shade is much more important. Eastern woodland species almost invariably do well in sun or in slight shade west of the Cascades. This is because of lower summer temperature and much less total sunshine for the year in the western country.

Reversing the statement, plants from the Cascades and west which are shade-plants at home require deep, dense shade in eastern states, while many of those which grow in full sun in their own territory are grateful for shade during the heat of the day when planted in eastern gardens. It must be remembered that even the western valleys and coast region have a mountain climate, with cool nights even during the hottest weather. This gives plants an opportunity to recover from the injurious effects of an exceptionally hot day.

Plants from the interior basin are more accustomed to heat, and also to unseasonable frosts. They are more likely to be killed by kindness in the form of too much

water than any temperature difficulties. They are prepared to go waterless for months, and too much moisture often kills them quickly. The gorgeous desert species of Pentstemons, Erigerons, and Eriogonums, for example, should do much better in the East than on the northwest coast. They need heat and drought in the summer in a measure which we cannot give them, while in winter our constantly recurring rains are too much for a plant accustomed to dry, cold weather during which the soil may remain frozen solid for months.

These western plants have a reputation for fussiness which is not entirely deserved, partly due to the fact that in the past only collected plants have been available. By the very nature of things, it is too much to expect a wild plant torn from its natural setting, probably with the loss of more than half its root-system, to travel across the continent and easily establish itself in a strange environment. When some plants, the native Iris for example, are examined, the wonder grows that anyone attempts it. Such plants make wandering rootstalks which stop only occasionally from their eternal poking about the rocks to form a small tuft of feeding-roots. They are entirely incapable of reëstablishment in cultivation except under the most favorable circumstances. This usually means planting them in sand-beds and growing them on until the roots are adequately developed before planting them in the garden.

When nursery-grown and transplanted once or twice, such plants produce compact root-systems just

like those of other well-behaved nursery-grown plants prepared for the garden. While collected plants are often difficult if not taken at the proper season, nursery-grown specimens of the same species can be handled at almost any time with no more risk than with any other cultivated plants. As such facts become better known and some of these gorgeous westerners become established, the undeserved part of their reputation will probably gradually fade away.

CHAPTER III

WESTERN AMERICAN ALPINES

ABRONIA. Sand Verbena.

This is a genus of both annuals and perennials that can scarcely be classed as either rock or alpine plants although the perennials are sometimes used in rock-gardens. They really belong to the seashore and sandy deserts of the Southwest, and the majority of the species are too tender for any except southern gardens.

A. latifolia, with fragrant yellow flowers, from the coast of Washington southward, and *A. umbellata*, with pink blossoms, from the same territory, are fairly hardy with me in Portland. *A. mellifera* (illustrated on page 26), from the sand-dunes along the Columbia east of the Cascades, is hardy enough, but its greenish white umbels have no special appeal.

ACHLYS. Vanilla Leaf.

A. triphylla, our only species, is a smooth perennial herb with a creeping rootstalk, bearing a single, ample leaf divided into three wedge-shaped leaflets, arranged around a common point. The small white flowers are crowded into a compact spike at the top of a naked stalk which rises above the leaf.

This common inhabitant of the heavy fir forests of the northwest coast is well known as Vanilla Leaf or Sweet-After-Death because of the distinct odor of the drying leaves. Dwellers in the coast sections often hang bags or bunches of the dried leaves in their houses because of this delicate fragrance.

ACONITUM. Monkshood. Wolfbane.

Of several similar Monkshoods, I have grown only *A. columbianum* which reaches two to four feet in height and flowers in early summer. It is very similar to the blue-flowered European forms in cultivation and has about the same garden value. In poor, granitic soil it is sometimes dwarfed to a twelve-inch stature, a quality it promptly loses when introduced to better living.

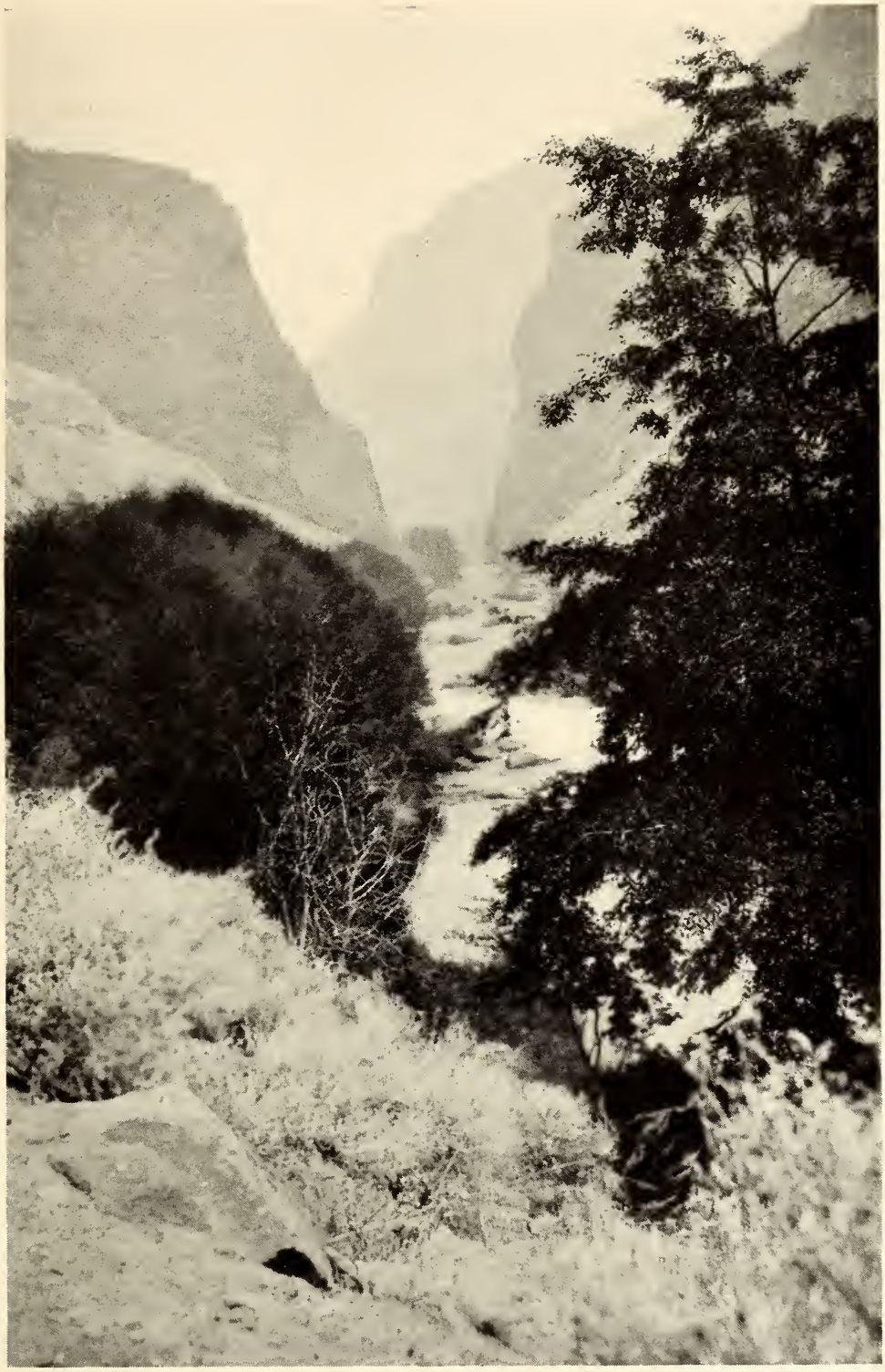
ACTÆA. Baneberry.

Tall, shade-loving perennials, too robust for rockeries, although useful for shaded places, where their racemes of white flowers, followed by brightly colored polished berries, show to the best advantage.

A. rubra of the eastern states comes into eastern Oregon and Washington; and *A. spicata*, with either red or white berries, is found from the coast to the Rockies.

ALLIUM. Wild Onions. Wild Garlic.

The West is filled to overflowing with numerous species of Wild Onions represented by myriads of individual plants, until, at onion-blossom time, the mountainsides smell as no garlic factory ever could, to hasten the footsteps of a passer-by. The varieties run into the dozens, few of which are ever offered for sale and still fewer purchased. American gardeners as a class betray a great and apparently permanent lack of interest in these plants, and yet there are some among them that rank high in beauty to those able to overlook their odor. See page 26.



Crooked River Canyon makes a great gash in the desert and is the haunt of many an elusive desert plant. Photograph by the Author

Abronia mellifera. Photograph by the Author

Alliums grow in profusion. Photograph by U. S. Forest Service

A. cernuum is a widely distributed species with nodding pink flowers. *A. acuminatum*, with stiff, upright, open heads of reddish purple flowers, covers the mountains and plains alike with a purple mist at blossom-time. *A. geyeri* has rose-colored flowers. These three are as showy as any yet seen, although there are probably numerous others just as good if not better. *A. falcifolium* from the Siskiyous is quite similar, except for its scythe-shaped leaves. *A. crenulatum* is a white or pale pink high alpine. *A. validum* is a robust Onion of the high, wet meadows, and has an odor even worse than others of the family, if such a thing is possible.

ANDROSACE.

A. carinata is the latest alias under which the American representative of *A. chamæjasme* is found. Its fluffy, tufted rosettes and dainty sprays of soft pink to creamy white blossoms are very similar to those of its European cousin. The fatter, larger leaf is the principal difference which distinguishes this inhabitant of the high Rockies of Colorado and Montana. This American Androsace is not cultivated extensively. It should be suited in any well-drained rockery under conditions favorable to others of its family.

ANEMONE. Windflower.

The showy Anemones or Windflowers are well represented in the western mountains. Some of them are true children of the snow, flourishing at or near timberline on the highest peaks. Others are wood-

landers of the lower slopes, happy in well-drained, half-shaded soils. The list which follows is far from complete, but these species are outstanding westerners which are offered frequently enough to justify an attempt to secure them as a sporting proposition at least.

A. oregana. This dainty little sprite must stand at the head of the list. True, it does not make the vivid show of some others, but its appeal is irresistible. In general appearance it is a refined *A. nemorosa*, a common thing in the eastern United States. There are usually no basal leaves on the flowering crowns, but, instead, simple, straight stems two to six inches high crowned by a whorl of three leaves, each composed of three more or less strongly dentate leaflets. Each of these three-parted leaves has one distinct stem of half an inch or more. The single cups, raised an inch or so above the leaf-whorl, are pure, pearly white, soft pink, or delicate blue. Whatever the color, the tone is soft and pure. It is a most appealing little flower in any hue. In the Cascades of Oregon, white is the general color-form although there are localities, such as the eastern slope of Mount Hood, where nearly all specimens are blue. It is a woodlander, at its best in cool, damp forests of spruce or fir at 4,000 feet and up. In the garden, a soil well filled with leaf-mold and a shaded location, meet its needs. It is illustrated on page 35. *A. lyalli* is a similar dainty thing; in fact, so far as gardens are concerned, they are identical. *A. drummondi*, seen occasionally in catalogues, is the American counter-

part of the European *A. baldensis*. This is one of the snow children, often impatiently pushing its soft blue flowers through the edge of melting drifts. Both the basal leaves and the three which form the whorl below the flowers are much divided into narrow, linear segments, and the flowers are of ample size to balance the accompanying foliage, although later flowers are apt to be somewhat faded and smaller. The flowers are followed by densely woolly seed-heads which are attractive in themselves. It is particularly happy in the pumice slopes of some of the towering old volcanic cones of the Cascades as well as in the timbered talus slopes on some of the higher California and British Columbia mountains. The wise gardener will give it the sunny moraine or scree treatment required to make it happy.

A. deltoidea, the showy little Three-leaved Anemone, is a pleasant lowlander. It is found throughout western Oregon and Washington in the river bottoms as well as on the mountain slopes, being somewhat larger and more robust than *A. oregana*, with three entire, stemless, ovate leaves forming the involucre. These leaves are usually more or less toothed or notched, especially toward the outer end. The pure white flower is considerably larger than that of *A. oregana* and is carried well above the foliage. This is a happy, little shade-loving species which is comparatively easy to establish in any cool, rich loam. In a few of the river bottoms, especially in western Washington, it develops considerable color variation into pale blue and soft pink. With some of the more

enthusiastic local wild-flower gardeners, hunting for color-forms of *A. deltoidea* is a regular May and early June sport. Once established in the garden, they seem to hold these almost ethereal tints as well as in a native state—something that does not always hold true of color-forms. Illustrated on page 35.

One other western Anemone of this type claims our attention before passing on to the next group: *A. narcissiflora*, only occasionally offered by western collectors, is, according to Rydberg, really *A. zephyra*. In other words, it seems to be the American representative of that much-desired European alpine rather than identical with it. With us it is a true arctic alpine, clinging closely to the timberline on the highest mountains of Colorado and Wyoming and extending from there northward to Alaska. Western America is so full of Ranunculus that I suspect this plant is often passed by as only another Buttercup, despite its much divided and cleft leaves, for it has much of Ranunculus about it. The basal leaves are ample in outline, divided into three to five major divisions, each in turn split into several obtuse lobes. The involucral leaves are much smaller, sessile, and three-cleft. Above these are carried large, clear pure white flowers some eight to ten inches above the ground.

The West furnishes two species of those great hairy Anemones, American cousins of the glorious *A. pulsatilla*, or *Pulsatilla pulsatilla* so well known in gardens, both well suited to appear in company with their European relatives. The first is now to be found under the

name *A. patens nuttalliana*, or occasionally as *P. hirsutissima;* Rydberg called it *Pulsatilla ludoviciana;* but under whatever cognomen it may be hiding, the Pasque Flower, May Flower, or Wild Crocus, is the children's flower from the Mississippi River far into the western country. As soon as the frost is out of the ground, the great hairy buds push up into the sunlight and open great cups of palest purple, partially filled by a central mass of golden stamens. Following the blossoms, the later of which are often a softly tinted white, come the greatly dissected basal leaves. Like *A. pulsatilla*, each seed is furnished with a long, persistent, silky tail, and the tall seed-heads are in themselves a decided ornament to the garden.

When once obtained, these Anemones should be left alone, allowing the crowns to grow larger and larger with each passing season. If necessary, they can be lifted and carefully divided in midsummer, or later, when the seed-pods are ripened, but a better way is to sow seed as soon as it is thoroughly ripe and use seedlings to fill desired places in the garden.

A. occidentalis, also listed as *Pulsatilla occidentalis*, is the American *A. alpina*. It is also a lover of the mountain heights, usually one of the first to bloom with the coming of summer. I remember vividly one visit to Mount Hood in early July. Struggling upward through the timber in softened snowbanks, often waist deep, our party eventually came to a little clearing which proved to be the first opening near timberline. From here upward were bare spaces, with banks of snow only in the shadows of the last clump of trees,

filled with the great soft white chalices of *A. occidentalis* resting almost on the ground. Two months later the same meadows danced with myriads of soft gray plumes on fifteen-inch stems, as the Alpine Anemones hurriedly ripened seed in preparation for another long sleep under the snow. See illustrations, pages 36 and 41.

This species is not difficult to keep alive if given good drainage and plenty of water, but, so far, I have never seen it entirely happy away from its mountain home. For one thing, in the valleys, particularly at Portland, it wakens much too early, attempting to show its flowers with every mild period of winter weather. Here the arrival of spring is a long-drawn-out affair, with many reversions to freezing weather, while summer comes with a rush to its mountain home, once the snow is gone. As a consequence, the flowers are usually small, more or less unkempt because of the frequent rains, and often blighted. Perhaps if established in a garden and left undisturbed it might slowly adapt itself to our conditions, but my garden, so far, has never seemed to lie undisturbed for a long enough period of time.

ANTENNARIA. Indian Tobacco. Everlasting.

These ubiquitous plants have little or no appeal to the average gardener, even to those that go into ecstasies over the dirty gray stars usually forthcoming in American gardens from the famous, and therefore of necessity wonderful Edelweiss! They belong to the same family, but lack the broad, star-like, silvery leaf-bracts below the flower-heads. Our species are

largely too straggly and all-pervading for garden use and, in addition, usually fail to keep the snowy whiteness which they wear in homes of their own choosing.

A. dimorpha is a tiny dwarf with beautiful, silvered foliage which raises high hopes, but the gardener who transplants and guards it has a shock coming. It will open a few dingy white heads which quickly form seed and blow away. The foliage is the sole attraction this fraud has to offer, and most gardens are so full of plants with good flowers in addition, that few have any room for such as offer only half a loaf.

Apocynum. Dogbane.

A. androsæmifolium would be a rather attractive little garden shrub of some twelve inches were it not for its weedy tendencies. The deep-seated, creeping roots are almost impossible to eradicate once they are thoroughly established. It has ovate, opposite, pale green leaves, pubescent beneath, and small white or rose-colored urns in tiny open heads on the ends of the branches or in the leaf-axils.

Aquilegia. Columbine.

The gorgeous western Columbines are, as a rule, thought somewhat too big except for the larger rock-gardens, but they can be used to better advantage than most two- or three-foot plants because of their neat habit of carrying the foliage-mass low, allowing only the flowering stalks to rise much above twelve inches. A large stone, half concealed by their airy stems and dancing blossoms, is an asset to any rock-

garden, although to get the best effect the rock should be more or less covered by some sheeting evergreen against the time when the Columbines fade. They also do magnificently in front of the shrubbery which is occasionally used so effectively to frame the rock-garden.

There is one striking exception in the almost incredible *A. jonesii* only now beginning to appear in the gardens of the most ardent collectors. In its most alpine forms, from the screes of the high Rockies, it is an almost flat, rock-hugging mass of daintily cut, silvered leaves, above which stand the upturned faces of the enormous, dark blue, almost spurless flowers, on short stems. At most, it does not exceed eight inches in the subalpine forms. Needless to say when once obtained it should be given most perfect drainage.

Next to it stands *A. cœrulea*, the well-known Colorado state flower. Its huge, upturned, soft blue-and-white, long-spurred butterflies are by now a familiar sight in many gardens. The foliage-mass is decorously compact, some ten to twelve inches, above which tower two-foot stems, each carrying a number of heavenly blue blossoms. *A. leptocera* is a creamy white version of *cœrulea* from the higher ranges of Utah and Nevada. In the higher mountains of the Southwest, *A. chrysantha* flings out two- to three-foot stems on which dance numerous yellow flowers with unbelievably long spurs. *A. pubescens* happens to be a California alpine with very delicate, lacy foliage and small lavender-white flowers. With me it has been rather fussy and unsatisfactory. *A. formosa* and *A.*

Anemone oregana, one of the daintiest of flowers
Photograph by U. S. Forest Service

Anemone deltoidea, the showy little woodlander
Photograph by C. L. Marshall

Anemone occidentalis shows its fine white chalice in early spring, which may be mid-July in its alpine home. Within a few weeks the flowers are followed by gray, plumy seed-heads which are extremely decorative. Photographs by George C. Stephenson

truncata are widely distributed westerners quite similar to *A. canadensis* of eastern states. There are others, particularly in the Southwest, which are of doubtful hardiness in northern states.

ARABIS. Rock-Cress.

There are many Rock-Cresses found throughout the West, most of which are of little or no use in the garden. One common type has dandelion-like rosettes from the center of which one or more stems rise six to twelve inches. Many of them carry a few half-closed, tiny flowers of rather washed-out pink or dirty white. A second type is a semi-woody shrub six inches or more, often carrying similar insignificant flowers. The few species with any garden value are all more or less miffy. See illustrations on pages 41 and 42.

A. blepharophylla, a representative of the first group, has a rosette of rather coarse, dandelion-like leaves, sparingly covered with long hairs, above which ten- to twelve-inch stems bear heads of comparatively large, clear pink flowers. It is a fussy lover of half shade and requires perfect drainage. *A. purpurascens* is smaller and daintier, with dark or rosy purple flowers on six- to eight-inch stems. The compact rosettes are small and somewhat in the style of *Erinus alpinus*. It is even more fussy than the preceding, and is rather short-lived besides. When happy, it increases by producing new crowns on short side-stems which soon form independent root-systems. Occasional plants are found in which the entire plant has a dull

purple-bronze flush. *A. koehleri* is a shrubby type with a somewhat happier disposition. It grows in crevices in the rocky cliffs, particularly the serpentines, of southern Oregon and northern California. At its best it is a compact, woody shrub of some six inches, covered with spatulate, more or less toothed leaves beneath short stems carrying dark ruby-red flowers. A real treasure when perfectly happy but otherwise it is a shy bloomer. It requires rather poor soil, good drainage, and plenty of sunshine. *A. breweri* is the same or very similar.

In addition to these, there are doubtless other Rock-Cresses of value concealed among the remaining numerous species.

ARCTOSTAPHYLOS. Manzanita.

The Manzanitas, with red bark, powdered pale green leaves, and little nodding urns of pale pink flowers, form an important part of the brush-cover over much of the Pacific coast. This is particularly true of the southern part of Oregon and northern California where there are numerous species much too large for alpine or rock-gardens and of doubtful hardiness in the East.

A. uva-ursi, the little Bearberry or Kinnikinnick, has such a wide distribution through the northern hemisphere that it needs little description. Its prostrate masses of red stems, covered with little, oblong or obovate, leathery, dark green leaves and showy red berries, make it one of the best for woodland ground-cover or for trailing over shaded walls. It is much

used already for such purposes, but deserves a far more important niche in most gardens than it occupies at present.

A. nevadensis, a sprawling, prostrate shrub from the high Cascades, with bright green, oval, sharply toothed leaves, has the usual reddish bark, white flowers, and red berries. It grows to the height of one foot and is a distinct addition to rock-garden shrubs. Pictured on page 47.

ARENARIA. Sandwort.

Arenarias are numerous and often wide-ranging plants, the most of which it is well to leave in their native haunts. Many are annuals and some pestiferous perennials. Fortunately, there are alpine forms with woody stems and tightly packed foliage of such dainty habit as to deserve an honored place in any garden. Numerous sorts have been given names and several of them sound attractive.

In addition to *A. verna* and *A. laricifolia*, both dwarf, creeping mats of bright green foliage, covered in season with tiny white flowers, which are common alike to mountains of the Old and New World, I've tried only one.

A. nuttallii from the Cascades of Oregon and Washington, when well grown, makes compact little mounds of foliage so fine that it resembles bright green fur, liberally sprinkled with tiny white star-like flowers in the spring months. Its foliage is finer than *A. verna* raised from European seed. A garden plant of the first rank, it should be given a choice crevice,

preferably on the north side of a rock, into which it can thrust its huge, woody roots.

A. rubella from the Olympics, and *A. obtusiloba* from the northern Cascades, are quite similar plants which are sparingly cultivated at present. *A. verna* grows faster, and *A. laricifolia* is somewhat taller and more robust and is found from Montana northward.

Doubtless there are others just as good, and any woody, compact-growing alpine Arenaria is worth trying, but avoid at any cost those described as sheeting or rapid growers, as they soon overgrow the garden to the great detriment of more delicate things.

ARMERIA. Thrift.

The common Sea-Thrift, *A. arctica*, is found in the sand-dunes and sea-facing cliffs along the entire Pacific coast. Above the basal mass of narrow, grass-like foliage, arise heads of white or washed-out pink, papery blooms on rather stiff six- to eight-inch stems. An occasional plant shows good color, but the majority of them in no way compare to the varieties already in cultivation.

ARNICA. Arnica.

This cosmopolitan family of cheerful yellow daisies of ample size has a refined bearing often lacking in composites. The species are almost endless. In fact, with Arnica as with Pentstemon, it seems impossible at times to go over the summit of a hill without finding another species. None of them is in actual cultivation on a large scale. In fact, such as I have suc-

An exceptionally fine plant of *Anemone occidentalis*
Photograph by George C. Stephenson

Arabis blepharophylla, a fussy but showy Rock Cress
Photograph by the Author

Arabis koehleri is a showy little gray-leaved shrub with dark red flowers
Photograph by the Author

Arabis purpurascens is another fussy little plant well worth growing
Photograph by the Author

ceeded in preserving at all, as well as those in the gardens of others, advertise only too plainly that they are not long for this world. And yet entire mountainsides are carpeted in dancing gold by these same fussy beauties, one of which is pictured on page 48.

A. cordifolia, *A. latifolia*, and occasionally others are offered with no guarantee of results. All these westerners are plants of the wooded mountainsides where the duff of rotting wood and decaying fir- and spruce-needles is often filled with their rambling rootstalks. When, if ever, they are brought into cultivation, they will be most desirable in the shaded portions of the garden.

ARTEMISIA. Sage.

None of the Sages have found favor in the eyes of American gardeners, and they are seldom seen except in botanical collections. Some of the more dwarf-growing might well be used in the larger rockeries for their aromatic odor and silvery foliage. Among those suitable for this purpose are *A. spinescens*, a stiffly branched species of some eighteen inches from the great interior plateau country. *A. canadensis* grows some two feet, and *A. discolor*, a mountaineer of about the same stature, found both in the Cascades and Rockies, has silvery hair mainly confined to the under surface of the leaves.

ASARUM. Wild Ginger.

The Wild Gingers in the West are, with one exception, similar to common *A. canadense* so familiar in

eastern woodlands. This exception is *A. hartwegii*, which has soft green leaves, each of which carries a more or less extensive silvery white patch in its center. The others have big, heart-shaped, dull green leaves in pairs.

A. caudatum from the northern mountains and *A. lemmoni* from California are the two usually offered. The former is illustrated on page 47.

They function chiefly as ground-covers in dense shade. Their odd, dull red urns lack decorative effect, even if they were not entirely hidden by the big leaves.

Asclepias. Milkweed.

While our part of the world lacks the great variety of tall Milkweeds found in the eastern states, it can boast of one that should be a garden companion to *A. tuberosa*. *A. cryptocerus*, from the arid plains of southern Oregon through Utah and Nevada, is one of the odd, striking things of the desert. Its sprawling stems, a foot or so long, clothed with three or four pairs of big, rounded leaves, ending in big showy heads of greenish yellow and purple flowers, furnish one of the most weirdly attractive color combinations to be found anywhere. I imagine it might easily cause acute agony to some super-sensitive souls, but the plant is showy and has the same fascination and eerie appeal as *Iris susiana*.

Aster. Aster.

The genus Aster runs riot over all America, but, unfortunately, most species are too tall and vigorous for any but the largest rock-gardens. Through the

lowlands of the East and the mountain valleys of the West, Asters contribute a large share of the late summer and fall color. Some which are considered roadside weeds in the midwestern states have crossed the Atlantic and contributed their blood to the glorious "Michaelmas Daisies" that return to us from European shores as named varieties at fancy prices. This is not to be regretted, but rather honor should be accorded to European gardeners who visioned the possibilities in them that we were unable to see. Many of the species themselves are suitable for the perennial border, but there are comparatively few true Asters that have climbed the mountain heights and developed the compact growth and high color that makes alpines so fascinating. They have left that to their nearest cousins, the Erigerons, and under that name will be found the majority of dwarf aster-like plants of the western ranges.

Few of the following are ever offered in catalogues, and this is by no means a guaranteed list of the dwarf mountaineers, for the race of Asters is large and so is the mountain country, which might well produce others. It is safe to grab anything in the line of dwarf perennial Asters offered, as I have yet to see an absolutely unworthy one.

A. kingii, having so far successfully secreted itself in the higher ranges of Utah, is in few gardens. It is a dainty cæspitose species with a short, woody rootstalk and spatulate, basal leaves. The large blossoms on four- to six-inch stems above a few very tiny linear leaves, are solitary. Its narrow rays are deep violet

in contrast to a clear yellow center. The ensemble is like a somewhat refined *A. alpinus*.

A. alpinus from the high summits of the Rockies is identical with the widely cultivated European Aster of that name, although possibly slightly more hairy.

A. andinus, a dwarf from the high Rockies, with oblanceolate to spatulate leaves, has comparatively large flowers on one- to six-inch stems. *A. apricus* (also *A. foliosus*) inhabits the higher peaks from the Rockies to the Coast as far south as Oregon and Colorado. In its most alpine forms it is a compact two- to six-inch dwarf, somewhat pubescent, with long oblanceolate lower leaves and large, purple-rayed Asters on solitary stems.

A. meritus varies greatly in the wide range of alpine territory from Oregon and Wyoming, far north into Canada, which it inhabits. Once I had in cultivation for a brief time a tiny dwarf *A. meritus* from the granites of the high Wallowas at the head of the Imnaha. It had long, whip-like roots, a few oblanceolate basal leaves, and a whorl of smaller lanceolate leaves below each solitary large violet Aster. The entire plant did not exceed two inches.

A. scopulorum (*Ionactes alpina*) is an enchanting dwarf, its short stems decorated with tiny, oblong, gray-green leaves, almost imbricated in the best form, and covered with a single, big, pale violet blossom.

ASTRAGALUS. Rattle-weed. Loco-weed.

This is an exceedingly abundant group of legumes, often with beautifully silvered, compound foliage and

Arctostaphylos nevadensis is a sprawling shrub suitable for large rockeries
Photograph by C. L. Marshall

Asarum caudatum makes a fine ground-cover in dense shade
Photograph by C. L. Marshall

Arnica cordifolia stands as a representative of a race of refined yellow daisies. Photograph by U. S. Forest Service

Balsamorhiza sagittata. A dwarf, sunflower-like plant
Photograph by U. S. Forest Service

curiously inflated pods. I must confess that in spite of my enthusiasm for native flowers, I have yet to see an Astragalus that aroused any wild longing to possess it as a garden plant. Despite their beautiful foliage, the flowers in varying colors, mostly white, yellow and purple, never quite seem to reach the standard of beauty required of garden plants. The flowers are small or dingy, or both. This is not to say that among the multitude of Rattle-weeds there is not somewhere a hardy one worthy of cultivation. There may be, indeed by all the laws of chance there ought to be, but I have not yet seen it.

AZALEA. Azalea.

A. occidentalis, the only western representative of this gorgeous race, is a robust bush sometimes up to twenty feet or more in exceptionally favorable conditions, although usually more nearly six. In one little gully facing the Pacific Ocean, in extreme southwestern Oregon, are several specimens that reach the proportions of small trees. There are two distinct color varieties of this deciduous shrub, the more common being a cream-white corolla striped with orange. There are, in some localities, colonies in which the orange is replaced by a soft pink. In either case, the flowers are exceedingly fragrant and so bountifully produced as almost to hide the bush. This hearty grower is useful only in the larger rockeries, being more suited for the shrub-border or for naturalizing in wet spots along stream-banks.

BALSAMORHIZA. Balsam-root.

Like rather coarse, showy sunflowers, with numerous, long-stemmed, basal leaves and large, light or bright yellow to cream-colored heads, many species are common throughout the West. So far, they have proved somewhat intractable in the garden, although several species have lived for varying lengths of time, but they either stubbornly refused to bloom at all, or at best produced stunted, deformed flowers. The stout, brittle feeding-roots find transplanting little to their liking. Some species may be of considerable value in a large rock-garden. They are easily divided into two groups: those with entire or bluntly toothed foliage, and those with leaves much divided into lobes arranged along the central stem. All grow on dry, open hillsides and should be given similar situations by those wishing to try them.

In the first class fall *B. sagittata*, *B. tomentosa*, *B. deltoides*, and *B. careyana*. In the class of pinnate-leaved forms are such species as *B. incana*, *B. floccosa*, *B. trebinthacea*, *B. macrophylla*, *B. hirsuta*, and *B. hookeri*. Because of its wide range, *B. sagittata* is most likely to come into cultivation. Its long, spear-pointed leaves, with a heart-shaped base and big yellow sunflowers, on twelve- to eighteen-inch stems, are a spectacular contribution to the spring floral display almost everywhere in the great semi-arid districts. The entire plant is more or less covered with short, dense hairs or fuzz, especially noticeable on the lower sides of the leaves. This also has a fine cream-colored variation which is much more

attractive than the yellow one. See illustration on page 48.

B. tomentosa from Wyoming is similar, but with somewhat narrower leaves distinctly toothed on the margins. *B. careyana* lacks the white hairs of *B. tomentosa* and is otherwise quite similar to *B. sagittata*. *B. deltoides* is the least valuable of the lot, being a big coarse *B. sagittata* from the Klamath country.

Of those with divided foliage, *B. incana* is silvered with fine white hair. The finely divided foliage and smaller bright yellow flowers give to this plant a daintiness which is lacking in those previously discussed. It is found on dry hillsides from Montana to California and is pictured on page 57. *B. hirsuta*, found on dry slopes from British Columbia to Utah, is the smallest with very finely divided leaves, beautifully silvered, and clear yellow flowers on ample stalks. The others are much alike and intermediate in garden value between these two.

BERBERIS. Barberry.

The western Mahonias, or Barberries, are exceedingly good evergreen shrubs. *B. aquifolium*, the state flower of Oregon, generally known as Oregon Grape, is too large for small rock-gardens. For larger gardens it is invaluable, particularly when subjected periodically to severe pruning when the plant has become leggy. Its shiny, pinnate, sharp-spined, evergreen leaves, each consisting of from five to seven leaflets, turn beautifully red and bronze in the fall and winter. In addition, the spring display of great

bunches of yellow flowers, followed by grape-like bunches of blue berries, is unusually attractive. In any season it is a beautiful shrub, and Oregonians need not apologize for their selection of a state flower. See page 57.

B. repens is a creeper, carrying foliage of three to five leaflets similar to those of *B. aquifolium* but smaller. It is an inhabitant of the higher mountains in semi-shaded places and is now becoming known in gardens.

B. nervosa is a dwarf from the lower forest with long, stiff, fern-like foliage carried as a cluster on the top of a short, woody stem. Each leaf consists of nine to fifteen leaflets which are narrower and more elongated than those of the two preceding species. The entire plant is not often over eighteen inches high, and while the leaves lack the glossy finish of the Oregon Grape, it is valuable, particularly for shaded portions of the rockery.

BRODIÆA. Fools Onion.

For some reason these conspicuous bulbs have never attained the popularity their beauty would lead one to expect. They are perfectly hardy, easily grown, and produce big heads of showy, papery flowers of almost everlasting qualities on stems that are a trifle too long and slender, a fault that produces a somewhat leggy look. This is further enhanced by the fact that the long, narrow, grass-like basal leaves often entirely disappear by the time the blooms come. Brodiæa is Hookera in some botanies.

The bulbs are onion-like without the onion odor,

and the flowers little trumpets, often with wide, flaring bells, arranged in compact heads. Blue and white are the dominant colors although there are a few yellow and one red species.

B. ida-maia. The Fire-Cracker Plant is the showiest Californian of the Brodiæa group, or was until it became a Brevoortia. It has the usual pair of long, flopping, grass-like leaves at the base of the long, naked, two-foot stem, from the upper end of which dangle several most surprising flowers. The long floral tube is bright red and the scarcely expanding bell of the trumpet vivid green. This is one plant aptly named, for the loose cluster of blossoms looks for all the world like a bunch of fire-crackers with a bright green band around the business end.

B. capitata, a common, widely distributed sort with heads of small bluish purple flowers on two-foot stems. The least attractive and consequently most frequently offered. A picture will be found on page 58.

B. grandiflora or *B. coronaria*, the Harvest Brodiæa, is a dwarf, eight inches or less, with rigid, branching stems and a few comparatively enormous blue trumpets that are second only to the gentians in color and size. Aside from the bareness of the stems, these June-blooming beauties have every qualification of first-class garden attraction.

B. pulchella, with purple-blue flowers in a dense head, comes from the coast region as many others do. *B. laxa* is a Californian, with large, deep blue flowers in rather open heads. It is somewhat better balanced than most species of the genus.

B. hendersonii from the Siskiyous has wide-open, starry flowers of pale yellow with a blue line drawn lengthwise through each petal. See page 58.

B. douglasii is common east of the Cascades and has big heads of pale blue flowers which often gradually change to white on the open end of the trumpet.

There are many others, particularly in California, but these are the most striking. *B. ixioides* is yellow; *B. hyacinthina*, white; and *B. californica*, *B. howellii*, and *B. bicolor* blues of varying degrees of intensity.

CALOCHORTUS. Mariposa Lily. Cats-Ear. Globe Lily.

This great genus includes some of the most beautiful of all flowering bulbs, many of which are doubtfully hardy. There are three distinct types: First, the Fairy Lanterns; second, the Cats-Ears; and third, the gorgeous Mariposa Tulips. All of them have small bulbs with long, strap-like or linear leaves early in the season, but here the resemblance ends. They all require a warm, sunny location and good drainage, and many of the most beautiful Californians are not hardy in the North except under extremely favorable conditions.

The Fairy Lantern type is exemplified by two Californians, both quite commonly cultivated and hardier than many of their cousins.

C. amabilis, the Golden Lantern, has numerous soft yellow globes hanging from its branching stems, for all the world like tiny Japanese lanterns softly illuminated with a clear yellow light. With me it grows some six to eight inches, and is reliably hardy until

taken by mice, pests that seem to have an especial liking for this and other Calochortus bulbs. It is also known as *C. amabilis*.

C. albus, the White Globe Lily, is somewhat taller, with big translucent white lanterns that have such a frail, ephemeral appearance that one momentarily expects to see them burst and disappear like a soap-bubble.

The second class, appropriately named "Cats-Ears," has numerous hardy representatives. The entire center of the flower is filled with soft white hair, hence the name. These are not so difficult to grow as the next group and should do well in any well-drained soil.

C. maweanus and *C. purdyi* are low-growing, with pale lilac or pink to white flowers, densely filled with hair. There may be from one to four or five of these charming hairy saucers peering up from a single stem. Few bulbs are better suited for poking into crevices in the rockery or for naturalizing in an open place where competing vegetation will not be too overwhelming. These two have for me an especial elfin attractiveness not found in many bulbous plants of greater fame. Both are found in western Oregon and both are hardy. *C. purdyi* is illustrated on page 63.

C. subalpinus (also *C. lyalli* in part) is a soft yellow Cats Ear with a deep golden yellow center shining through the hair which does not fill the chalice to the same extent that it does in the two preceding. It is one of the most conspicuous flowers in the July landscape on the pumice slopes at timberline on Mount

Hood, Mount Jefferson, the Three Sisters, and others of the towering volcanic cones which break the skyline of the Oregon Cascades. See page 63 also.

It is a favorite with the little Mazama pocket gophers found abundantly on these slopes, the rodents gathering the bulbs into little storehouses about the time the seed-pods are well filled. It is a very common experience to find the ripening pods standing erect, with the bulb neatly nipped off and carried away by these industrious animals. As a result of their bustling activity, it is often more profitable for a plant-collector to hunt gopher storehouses and gather the bulbs by the pint instead of digging them one at a time, perhaps to find that only one standing stalk out of four indicates the presence of a bulb. Because of its resentment of the lowlands, and the high regard in which it is held as a food-supply by meadow mice, it is difficult to keep in gardens.

C. uniflorus is a smaller elf from southern Oregon and northern California, with clear lilac flowers and very little hair. *C. tolmiei*, *C. apiculatus*, and *C. elegans* are other hairy white to pink northwesterners which may be occasionally offered.

The big, excessively beautiful Mariposa Lilies or Butterfly Tulips are not for me in my Portland garden. They will blossom splendidly once or sometimes twice and then disappear. At that, these most brilliant of all native bulbs are so fascinating that I am always buying and planting more, feeling that one blooming period is ample repayment for the moderate cost. The beautiful *C. vesta* and *C. venustus* with its astonishing

Balsamorhiza incana has silvery foliage and smaller flowers of dainty aspect
Photograph by U. S. Forest Service

Berberis aquifolium, the State Flower of Oregon
Photograph by C. L. Marshall

Brodiæa capitata is one of the most common of its genus
Photograph by C. L. Marshall

Brodiæa hendersonii has yellow flowers lined with blue
Photograph by U. S. Forest Service

variations belong here. By all means get them, even if they have to be replaced each season. Nothing else quite so impossibly gorgeous exists in the West.

There are, fortunately, a few species of this group that come from more rigorous climates that behave somewhat better when brought into cultivation.

C. macrocarpus, a huge lavender and lilac cup decorated with dark purple or violet spots at the base of each of the three big petals, is the best, and, at the same time, the most easily cultivated for me. It is an inhabitant of the arid sections of eastern Washington and Oregon and the sage-brush areas of the Great Basin. One unforgettable June day, on the eastern slopes of Hart Mountain, a huge uptilted lava-fault in southeastern Oregon, I strolled out through the tiny grove in which two of us had made camp after nightfall, and beheld a miracle. The entire sage-clad slope was dancing with myriads of these great lilac bowls, the showy soft blue spikes of *Pentstemon speciosus*, and the more intense blue of *Linum lewisii*. Through the entire picture, the ground was sprinkled with the waxen water-lily-like blooms of the Bitter-Root, *Lewisia rediviva*. One who has not had the high privilege of seeing the desert sage burst into dazzling color in some such fortunate time cannot conceive of the beauty so lavishly displayed in such an unexpected setting.

C. nitidus is the same size and type as the foregoing, except that the huge silky flowers on twelve-inch stems are white, with big violet blotches toward the base of each petal, and the long leaves that appear

before the flower are lanceolate instead of linear, as in *C. macrocarpus*. This big Mariposa Tulip is found sparingly throughout eastern Oregon and in parts of Nevada and Idaho.

C. howellii, a smaller species from the Siskiyou Mountains, is quite similar but sometimes its petals are flushed with pink or pale lavender.

C. nuttallii, known as Sego Lily through parts of the Great Basin, is a still smaller member of this gorgeous group. Usually it is white with or without a dark spot at the base of the petals, but there is a most splendid clear pink variety in parts of Utah which ranks near the top of the list. It has been rather more difficult to hold in cultivation than the first three.

This brief catalogue by no means exhausts the possibilities of the Calochortus, but includes those with which successful results are most readily obtained.

CALTHA. Marsh-Marigold.

The Marsh-Marigolds are represented by two white forms in addition to yellow-flowered *C. palustris*, familiar to every boy and girl in eastern United States. The big clusters of butter-yellow flowers and succulent, rounded, shiny leaves are an integral part of the spring flora in the swampy places of the East, and to a less extent in similar damp locations along the northwestern coast.

The others are quite different. *C. biflora* has a basal mass of rounded leaves and clear white buttercups with a central mass of yellow stamens, each held above the foliage on an individual stem. It is one of

the most attractive of the alpine bog-plants and, fortunately, also one of those which take kindly to our gardens. Plenty of water into which the fleshy roots can be thrust are all that is necessary to its happiness.

C. leptosepala from the mountains of British Columbia, Montana, and Washington is similar, with more elongated leaves and about the same garden value. *C. chelidonii* from the banks of high alpine streams in Montana and British Columbia is a dwarf form with a larger flower. It is good if only it will keep the dwarf habit when brought into milder climes.

All others are segregates of *C. leptosepala* or very similar to it.

CALYPSO (CYTHERA). Venus Slipper.

The most enchanting of woodland plants, *C. bulbosa* is as capricious as its namesake. Growing from a tiny translucent corm, it is quite easily flowered the first season, if planted in deep shade in pure forest duff, but to persuade it to send up, year after year, its dainty, fragrant purple slippers, artistically trimmed in pink and yellow,—ah! that is another matter. Not that it is entirely impossible; for in several gardens, where ideal conditions are present, it has been done. In these cases it became a success by persistence in planting and replanting until finally, one lucky day, success arrived, and now each year the exquisite slippers appear promptly on schedule. See page 64.

CAMASSIA. Camas. Blue Camas. Wild Hyacinth.

Camas, once a staple article of Indian diet, is now interesting chiefly as a beautiful bulbous flower for

introduction into the wet parts of the garden. In rice districts and some of the other wetter agricultural lands it is regarded as a weed, but there are mountain meadows galore where for miles the blue of the Camas shimmers as the blue of the sea. The large bulbs are easily grown in any well-watered perennial garden or border and should be planted in generous clumps if they are to appear to the best advantage.

C. quamash (also *Camassia esculenta* and *Quamasia quamash*) is a widely distributed plant which has several forms or closely related species. For garden purposes they are all one. Early in the spring several linear leaves appear and spread out, star-like, close to the ground. Later a stout stalk carrying numerous starry flowers, which may be anything from dark blue to pure white, grows to a height of some two feet. It is illustrated on page 64.

C. leichtlinii, somewhat stouter, found west of the Cascades in western Oregon and Washington, has two color-forms. The original type-specimens were cream-colored, and there are areas, notably in the vicinity of Roseburg, Oregon, where practically all are of this shade. Elsewhere pale blue is a common color, with occasional cream or even dark blue individuals intermingled.

CAMPANULA. Bellflowers.

America is sadly deficient in Campanulas in comparison with the mountain ranges of Europe and Asia. In addition to *C. rotundifolia*, found across the northern hemisphere, we have only *C. piperi* to offer

Calochortus purdyi, a "pinky" Cats Ear of much attractiveness
Photograph by C. L. Marshall

Calochortus subalpinus, a favorite with gardeners and gophers
Photograph by C. L. Marshall

Calypso bulbosa, a difficult but lovely little orchid, is one of the most enchanting woodland plants
Photograph by George C. Stephenson

Camassia quamash, once an important food of the Indians, is now chiefly valued as a beautiful garden plant
Photograph by U. S. Forest Service

that can compare with many of the rock-garden Campanulas. Both are pictured on page 69.

C. rotundifolia, with its rounded basal leaves, long, narrow stem leaves, and numerous blue hanging bells, is too well known to need further description. It is exceedingly variable, and individuals with larger flowers and different color-shades can always be found by the careful collector. I remember one, indeed, which could only be a form of this species, and yet it was most striking, growing in the barren granite screes above timberline in the wild tumble of peaks and ridges south of Mount Rainier. It was a plant of some six inches, each stem carrying one or, occasionally, two comparatively enormous pale blue bells. It was better than any American Campanula I have yet seen. Roots were collected and carried home, but they were either lost in the mass of material obtained or failed to grow, as they have never reappeared. Even if I should succeed in recovering this plant, perhaps it would not keep the diminutive stature which makes it so attractive, but it has always been a cherished dream that some day I might again make that long, weary climb to those granite pinnacles and perhaps have better luck in finding and transplanting it.

A wee form carrying many botanical characters of this species has bloomed once in the garden. It forms earth-hugging mats of tiny, rounded leaves and carries the flowers on two-inch stems. So far it has behaved beautifully, but experience is yet too limited to warrant positive statements regarding it.

C. piperi draws everyone's eyes toward the rugged

ranges of the high Olympics in northwestern Washington. There it displays masses of thick, glossy leaves and bright blue, open flowers somewhat after the fashion of *C. garganica* of our gardens, but with fuller petals and brighter color. The leaves are small, lanceolate, or more or less spatulate, and conspicuously toothed. This rare alpine is scarce only in the sense that it is restricted to a limited area of exceedingly rough country. Within that area it is abundant, favoring northern exposures. It is rather slow-growing, requiring sharp drainage and some shade, otherwise it should be no more difficult than *Douglasia lævigata*.

No other western Campanula known to me is worth much effort to establish in the garden.

CAPNOREA.

Plants sometimes treated under this name will be found under Hesperochiron.

CARDUUS. Thistle.

C. occidentalis is a big, upstanding biennial sometimes cultivated by wild-flower enthusiasts. Despite its silvery white, woolly leaves and showy red blossoms, it is, nevertheless a Thistle, with all the faults of the family. Therefore, it has no place in a well-kept garden, although it may make a brave display with its towering four to six feet of silver, decorated with crimson flower-heads, on a dry and otherwise desolate hillside. No other native Thistles make any pretense of being anything but fit companions for the European invaders that infest our fields.

CASSIOPE. Moss Heather. White Heather.

Low, evergreen, heather-like shrubs, with tiny evergreen leaves, often imbricated, on the flopping branches, each of which carries little nodding white bells on short stems. This is an abundant timberline genus on numerous western ranges, often occupying many acres with such solid mats as to exclude all other plants. There are two species very much alike in general appearance.

C. tetragona, with a circumpolar distribution, has a deep furrow on the back of the leaves. *C. mertensiana*, which is without the furrow, has a southerly distribution, being more common and somewhat easier of cultivation. These require good drainage, a slightly acid soil, and plenty of moisture, at least through their growing season.

CASTILLEJA. Indian Paint-Brush.

The Castillejas are the most barbarically brilliant race found in the West, and much of the superb midsummer alpine display is due to their bright color. The blossoms themselves are insignificant in comparison with the highly colored leafy bracts which furnish the real show. Blood-red, clear crimson, and dark pink are the tones upon which the Indian Paint-Brushes base their claim to a place in the sun. Few of them have been successfully grown in cultivation, and there is more than a suspicion that the curse of root-parasitism lies heavy upon Castilleja. If ever these plants become culturally possible, they will make a glowing addition to the garden, provided, of course,

that these painted beauties retain their brilliance when grown away from their native haunts. The list of species is almost endless, but nearly all are beautiful, and one cannot go far wrong in trying to establish any of them.

CEANOTHUS. California Lilac. Deer-Brush. Buck-Brush. Red-Root. Mahala Mat.

A large race of shrubs, some of them extremely beautiful, but mostly too large for the rock-garden. Among the larger forms suitable for the shrub-border, two of the best are *C. integerrimus* and *C. thyrsiflorus*. One member of the family, fussy and difficult to establish, it is true, is worth all the effort it costs. It is *C. prostratus*, an intricately branched, creeping shrub with tough, woody branches and thick, evergreen leaves which are spined and pointed into miniature English holly foliage, except for their dull green finish, bearing dainty little balls of lavender in May and June. There are forms with spineless leaves, just as there are forms with dirty white flowers, both to be avoided. Widely known throughout its range as Mahala Mat or Squaw Mat, this plant is at its best rambling about the base of some giant old yellow pine where it grows into prostrate masses a yard or more across. In its native haunts it seems strangely indifferent to soil-conditions, but it resents disturbance of its long, whip-like roots. When transplanted, it may drop all its leaves and still pull through. Again, it may seem happy and thrifty for a year or more and suddenly give up the ghost for no apparent reason.

Campanula piperi, gem of the American Bellflowers, is found only in the Olympics
Photograph by U. S. Forest Service

A fine alpine form of *Campanula rotundifolia* from the Olympics
Photograph by U. S. Forest Service

Hesperochiron pumilus is a little-known western plant
Photograph by U. S. Forest Service

Ceanothus prostratus is a real contribution to the rock-garden
Photograph by the Author

It should be given good drainage and some protection from the sun during the hottest part of the day. As it grows in the mountains of Oregon, Idaho, Nevada, Washington, and California, in many parts of which snowfall is scant and extreme winter weather of more or less regular occurrence, it should be hardy, from a temperature standpoint, almost anywhere in eastern United States. It is worth any necessary trouble to establish this outstanding creeping evergreen shrub. See illustration on page 70.

CHELONE. Turtle-Head.

For *C. nemerosa*, see Pentstemon.

CHEIRANTHUS. Western Wallflower.

See Erysimum.

CHIMAPHILA. Prince's Pine. Pipsissewa.

These showy members of the Wintergreen family are not, by any means, confined to the West. The two found in our territory are good enough for any garden, except for their antipathy to cultivation. The long, rambling rootstalks throw out only a few feeding-roots, so that obtaining rooted pieces is a somewhat difficult matter.

C. umbellata, the better of the two, has leathery, evergreen, lanceolate leaves, broadest below the middle, and sharply toothed. They are usually arranged in a more or less complete whorl, above which are carried the numerous waxen, pinkish flowers. *C. occidentalis* is a name applied to the western

form of this widely distributed species by some botanists.

C. menziesii is similar except that it has fewer flowers and the leaves are broadest toward the outer end. Both are found among the small ground-vegetation of dense coniferous forests and require shade and plenty of leaf-mold or duff to be happy.

CHLOROGALUM. Soap-Plant.

C. pomeridianum should be planted as a curiosity and not to add beauty, lest disappointment result. It produces enormous elongated bulbs covered by a mass of thick, fibrous husks, something like those of a cocoanut. The Indians used these bulbs for making lather, hence the common name. From the bulbs in spring come several long, narrow leaves arranged somewhat like those of a Camas, in a flattened rosette. Later in the season, a tough stem, four or more feet in height, is pushed up and a few small, narrow-pointed white flowers appear on the ends of naked, widely scattered stems. The whole inflorescence is so lacking in show that it is out of all proportion to the immense effort put forth to produce it.

CIMICIFUGA. Bugbane.

Like their eastern cousins, these are tall-growing perennials with compound leaves and spikes of white flowers in summer. They are sometimes offered in lists of rock-plants, but they are entirely too robust for such use and, consequently, are out of place in this book.

CLAYTONIA. Spring Beauty.

The Spring Beauties are attractive, but not particularly showy, members of the purslane family, with tuber-like roots, a few elongated fleshy leaves, and racemes of small white or pink flowers, all of which have about the same value. Whichever one is secured will prove to be a variation of little *C. virginica*, the well-known Spring Beauty of the eastern states, with white to pink flowers. The single exception is *C. aurea*, a yellow-flowered species from the Rockies. *C. lanceolata*, *C. umbellata*, and *C. megarrhiza* are northwesterners, with white to pink flowers, which may be offered. All of them when happy are more or less weedy in the garden, spreading everywhere with amazing promptness. They are best when naturalized in the half-shade along with Dentaria, Linnæa, ferns, and numerous other small and dainty woodland folk.

CLEMATIS. Virgin's Bower. Clematis.

Only one of the woody Clematis is of any interest to us, and that is known as *C. alpina tenuiloba*, or *C. tenuiloba*. In the Rockies of Montana and Wyoming it is a dwarf, spreading vine with leaves divided into three segments, each composed of three leaflets. Sprinkled over the foliage are rather large, dark blue flowers. At lower altitudes it becomes more robust and beautiful, but too vigorous for any save the largest rockeries.

C. douglasii is known locally as Sugar Bowl, Old Maids' Bonnets, Old Man's Whiskers, and Lion Beard, the two latter names referring to the seed-heads. In

general it strongly resembles the Pulsatilla type of anemone, common and widely grown garden plants. It has the same basal clusters of much-divided leaves covered with soft gray hairs, and the seed-heads waving like soft gray plumes are very decorative in themselves. The flowers are dark blue or purple, vase-like in form, numerous and nodding. Plants require the same treatment as *A. pulsatilla* and will make a desirable addition to any garden. Like the hairy early spring anemones, these Old Maids' Bonnets push their buds through the ground with the first breath of spring. The drooping, dark purple "sugar-bowls" are later followed by the much taller foliage and plumy seed-heads. The nodding flowers are fairly well shown in the picture on page 80.

CLINTONIA. Clintonia.

Clintonia furnishes two fine subjects for a shaded place in the rockery or for naturalizing in coniferous woodland where they revel in the deep leaf-mold. *C. uniflora* has a short, thickened rootstalk with two to five big, smooth, or slightly hairy, lanceolate leaves which serve as an effective background for one or two pure white, saucer-like flowers, composed of three sepals and three petals all alike. Each of these is followed by a dark blue berry covered with a bloom similar to that of many wild grapes. These white blossoms light up the darker woodlands of the Cascade and Coast ranges like so many dainty fairies, often the only relief from the somber colors prevalent there. A good picture will be found on page 79.

C. andrewsiana from the redwood districts of northern California is quite different. It is an upstanding plant with big, lanceolate, parallel-veined leaves crowned by an umbel of soft pink flowers some twelve to eighteen inches above the ground. The clustered berries are individually similar to those of *C. uniflora*. This plant needs dense shade, an abundance of leafmold, and plenty of moisture. It is reasonably hardy in the vicinity of Portland.

Coptis. Gold-Thread.

The Gold-Threads are dainty but inconspicuous woodlanders with small white flowers and are useful for naturalizing in shady places.

C. trifolia, a dwarf species of wide distribution, has three leaves, each divided into three lobes. Of the others, *C. asplenifolia* from the Cascades has the most finely divided foliage, while *C. laciniata* and *C. occidentalis* are somewhat coarser. The common name alludes to the long, bright yellow rootstalks.

Cornus. Dogwood.

C. canadensis, or Bunch-berry, is a wee Dogwood of almost irresistible charm, whether in flower or fruit. It creeps along in the duff of the forest floor, sending up from its woody rootstalks, stems of some two to three inches, at the top of which several leaves are arranged in a whorl, just below a closely packed head of little dogwood blossoms. Following these, and equally attractive until harvested by the birds, are the little clusters of bright red berries. The plant is

somewhat difficult to establish because of the scarcity of real feeding-roots in the clumps, but is well worth any reasonable effort for a shaded part of the rockery or woodland. Pictured on page 79.

CYNOGLOSSUM. Hound's Tongue.

The one Hound's Tongue from the Pacific Coast is *C. grande*, a woodland borage with clusters of big, hairy, lanceolate basal leaves and a stout twelve- to fifteen-inch stem, carrying a few deep blue forget-me-nots, each with a white ring in the center. It is one of the showiest of blue shade-loving plants whose only fault is its rather short life. Where happily established in the woodland, new seedlings come on each season. It is not a rampant spreader like many of its family, and must be given careful attention to get it established in most places. Seeds or small plants that have been previously transplanted offer the best chance to establish it. See page 80.

CYPRIPEDIUM. Lady-Slipper.

The western Lady-Slippers cannot match the regal splendor of *C. reginæ*. Neither can they equal *C. parviflorum pubescens*, the yellow Moccasin-Flower, known as a delightful rarity to many who spent their childhood in the northern and eastern states. Nevertheless, they have the same piquant charm and the subtle challenge to every real gardener as their more showy eastern cousins. It is still a real accomplishment to grow them successfully, although many are eminently successful at it. Shade, soil consisting largely of

leaf-mold, and a plentiful supply of water in early spring are necessary requisites. Shallow planting, with the growing tips just below the surface, is also important, as many a fine Cypripedium has been smothered by too deep planting.

C. montanum of the Rockies and Cascades has large, alternate and parallel veined leaves, and its white slippers are decorated with long, narrow brownish sepals. It is illustrated on page 85.

C. californicum is similar, but taller, with smaller and more numerous white flowers and greenish yellow sepals. It is found in California and western Oregon, often in the same general territory as *C. montanum*.

C. fasciculatum is a tiny, unassuming variety with two basal leaves and a short stem carrying an inconspicuous brownish slipper.

C. parviflorum, the small Yellow Lady-Slipper, is found as far west as British Columbia.

DARLINGTONIA. Pitcher-Plant.

D. californica, a weird, insect-catching plant from California and southern Oregon, always attracts a great deal of attention. Its clusters of huge, hollow leaves, often two feet high, with winged hoods cleverly arranged to guide guileless insects into its hollow interior, and their faint odor of decaying flesh combine to make a most effective trap. The bizarre, solitary, nodding flowers have greenish yellowish sepals, much longer and more conspicuous than the brownish red petals, and complete the picture of one of the oddest of western plants. The great leaf-

clusters are conspicuous in the swamp vegetation within its range, and few pass by them without stopping to look. In cultivation it requires an abundance of water within reach of its fleshy roots. See page 85.

DELPHINIUM. Larkspur.

From the Great Plains to the Pacific, western America is crowded with Delphiniums, some of them rivaling the blue of *Gentiana acaulis* itself, and many not in cultivation at present are appearing in increasing numbers in the catalogues of western dealers. They vary from dwarfs of eight to ten inches to six-footers with flowers varying from deep clear blue to dazzling red. There are both annual and perennial species. The Rockies and the semi-arid intermountain plateaus are rich in tuberous-rooted Larkspurs with scanty foliage, dwarf stature, and beautiful flowers. Contrary to expectations, these have, so far, not been too easily grown. The root-systems usually consist of one or more tubers quite close to the surface of the ground. From this comes a single stem carrying two or three much-divided leaves arranged alternately up the stem, and above them a short spike or open raceme of comparatively large, dark blue flowers. All of these tuberous-rooted forms require good drainage if they are to succeed.

In this class are found *D. menziesii* with dark blue flowers, *D. columbianum* with lighter blossoms, *D. depauperatum* with pubescent stems, and *D. simplex* with smaller flowers and pubescent leaves, the basal ones less divided than those of the other species. All

Clintonia uniflora lights up the dark western woodlands
Photograph by C. L. Marshall

Cornus canadensis is another dainty shade-lover
Photograph by C. L. Marshall

Clematis douglasii is known as Old Maids' Bonnet or Sugar Bowls. Photograph by U. S. Forest Service

Cynoglossum grande, a fine blue woodland flower
Photograph by C. L. Marshall

are dwarf, wide-ranging inhabitants of the great intermountain plateau between the Cascades and the Rockies, and give an idea at least of the possibilities among these Delphiniums.

D. hesperium, a somewhat taller species from western Oregon and Washington, is covered with thick, short white hair and carries open spikes of dark blue flowers on twelve- to eighteen-inch stems.

D. distichum, from the Snake River plains, is of the same stature, with very numerous blossoms in a crowded spike. It varies from white to pale blue, and the lower stems are heavily clothed with finely divided leaves on short stems. The effect of the entire plant is that of a miniature Lombardy poplar suddenly gone into flower production on a big scale.

D. geyeri, a gray-leaved species of about the same size, is sometimes encountered on the plains of Colorado and Wyoming. The upper sepals are yellowish, more or less tinged with blue, and the lower are deep blue.

All of them are suitable for the rockery or moraine garden, but in addition to these dwarfs, there are numerous taller species with fibrous roots which closely approximate the gorgeous hybrid Delphiniums in habit and appearance.

D. trolliifolium from the Cascades and Coast Mountains is one of the best. Growing in clumps three to four feet high, it carries foliage much like the garden varieties. Its close spikes bear clear dark blue flowers with white centers. Among the showiest of all the wild Delphiniums, it loves cool, shaded nooks in

mixed deciduous and coniferous growth along the stream-banks, and is proving invaluable for naturalizing in such places.

D. scopulorum is very like it except for deeply cleft leaves and more open spikes of flowers. It is at home in high meadows and open, well-drained hillsides of the higher Cascades. *D. reticulatum* from the Rockies, is similar with yellow and blue flowers.

D. cardinale, the tall scarlet Californian, is not entirely hardy this far north. It has very showy, trumpet-like flowers and requires sharp drainage with protection from winter wet.

D. nudicaule, a dainty red-and-yellow Delphinium from southern Oregon and northern California, grows best in rock-slides and talus slopes partially shaded by oak and madrone and filled more or less with the humus of their decaying leaves. Its fleshy, tuber-like roots are often found lying between two slabs of rock, the feeding rootlets threading through the accumulation of leaf-mold adhering to the surface of the rock. The leaves are palmate and deeply cleft into three or more segments. The small scarlet and yellow bugles are much too scattered to make an effective color display, although they are exceedingly dainty and well bred in appearance. *D. menziesii ochroleucum* is a western Oregonian, growing by preference in the heaviest clay, whence it is sometimes all but impossible to extract its fleshy roots without injury. The leaves are more or less deeply cleft and the flowers are white or cream, with dull green spots on the petals, after the fashion of snowdrops.

DENTARIA. Toothwort. Milk-maids.

D. tenella may stand as a fit representative of these pleasing little woodlanders. Coming in early spring, their clusters of comparatively large, bell-like, pink flowers are an exceedingly attractive feature of the western forests. Springing from tuber-like rootstalks are rounded, coarsely toothed, basal leaves, while the flowering-stems of some ten inches carry one or two leaves, deeply cleft into three linear lobes, and an open head of several pink to rose-purple flowers. The Toothworts spread quite rapidly, both by seed and by rootstalk, but never become weeds. They are exceedingly useful for naturalizing in shaded places where their dainty flowers are among the first to appear in spring. Numerous forms, with some variation in leaf-shape, have been described but all have about the same value. See page 86.

DICENTRA. Bleeding-Heart.

The Bleeding-Hearts are useful and, in some cases, showy plants of easy culture.

D. formosa, the most common in the Coast States, is quite similar to the eastern *D. eximia* except that the leaf-divisions are somewhat coarser and the flowers pink or dull red, paler than the corresponding shades of the latter. It is a vigorous spreader, growing too rapidly to plant near anything choice, but invaluable for dense shade where few other flowering plants can exist. If naturalized in such a place, it will quickly make large mats which, if plentifully supplied with water, will bloom longer

and more persistently than almost any other shade-tolerant plant. See page 86.

D. oregana is a true rock-inhabitant from the serpentines of the Siskiyous, restricted in distribution and at present little known. It is usually found most abundantly on northern slopes of broken talus where it tucks its fat rhizomes securely beneath the rocks and grows some six to eight inches high. This king of the family has curiously silver-plated leaves and closely packed racemes of creamy white flowers, the tips of which are more or less vividly tinted with purple. Despite its restricted range, it takes kindly to garden conditions and makes fine clumps in a well-drained rockery, particularly when planted so that the roots are sheltered from the sun. This is the plant which has been distributed as *D. glauca*, now correctly named as above. It is a distinct and welcome addition, and for five years has retained its characteristic foliage and flowers in my garden. The long blooming season and fine sprays of blossoms appearing for several months qualify it as the best dwarf Bleeding-Heart to come my way. During prolonged wet spells the silvered effect becomes somewhat obscure and leaves opening during such periods are often entirely without it. However, as soon as dry, warm weather comes, the silvered foliage promptly reappears. See illustration on page 91.

D. cucullaria is the well-known and well-beloved Dutchman's Breeches of the eastern states, the western form of which is sometimes called *D. occidentalis*. For garden purposes the two are inseparable, except

Cypripedium montanum, best of the western Lady-Slippers
Photograph by George C. Stephenson

A queer insect-catcher, *Darlingtonia californica*
Photograph by the Author

The pink flowers of *Dentaria tenella* come in early spring
Photograph by C. L. Marshall

Dicentra formosa, the Western Bleeding-Heart
Photograph by U. S. Forest Service

that, perhaps, the one found in shaded places in Idaho, eastern Washington, and northeastern Oregon is somewhat taller and more robust.

D. uniflora, a tiny rock-lover, is more valuable as a curiosity than as a garden plant. It consists of a few tiny leaves, in texture and form reminding one somewhat of miniature leaves of the common carrot. From among them come short stems, each bearing a small, elongated, dull red Bleeding-Heart. The entire plant may often be not more than two to three inches high.

DISPORUM. Fairy Bells.

Perennial herbs with branching stems, alternate, somewhat unsymmetrical leaves which are sessile or clasping, and drooping flowers of palest yellow, borne either singly or in clusters of two or three at the end of the branches. These are followed by showy bright red or equally brilliant orange berries. The ensemble is perhaps a foot to eighteen inches in height, and a shaded hillside covered with a mixed growth of ferns and Fairy Bells makes a pleasing picture, especially when the berries are ripe.

D. smithii, found along the coast from Alaska to California, has the largest flowers and is the best for all-round garden purposes. In the sunlight it will grow six inches; in the shade, sixteen. When happy it spreads somewhat slowly by creeping rootstalks to form little colonies that display its dark green foliage and orange fruit to best advantage.

D. oreganum from the Pacific Northwest inland as far as Idaho, *D. majus* found in the Rockies from British

Columbia to Arizona, and *D. hookeri* from the Siskiyous and Coast Mountains of California are sometimes available.

DODECATHEON. Bird-Bill. Shooting-Star.

The Primrose family is not well represented in western America, particularly in Primulas. In their place we have a wide variety of Dodecatheon, greatly beloved because of their brave early spring display. They are variously known as Shooting-Star, Bird-Bill, Mosquito-Bill, and, in books, as American Cowslip. All of them are children of the swamps or of hillsides and meadows well watered in spring or early summer. These slopes may dry out later and bake to a concrete-like hardness, which does no harm to the frail rootstocks, all that remains to provide next season's flowers. There are many species described which I have not yet seen. With one notable exception those known to me have a strong similarity and equal garden value, although they exhibit two distinct types of growth.

D. dentatum, from shaded places in the mountains of Oregon, Washington, and Idaho, has big, elongated, oval leaves on distinct stems in a basal rosette. The leaves are thin and noticeably toothed, in contrast to the thick, heavy texture and entire, or almost entire, margins of other cultivated forms. The flowers, borne in open umbels on eight- to ten-inch stems, are white with a purple spot at the base of each petal. Illustrated on page 101.

For garden purposes, the remaining species fall

into two or three groups, the first of which is well represented by *D. latifolium* (*D. hendersoni*). This is characterized by broad, oval, thickened leaves on very short stems, the rosettes compact and comprised of comparatively few leaves. The large, vinous-purple blossoms in open heads are more striking in the garden than many other species. See page 91.

D. cusickii from the Rockies of Wyoming and Montana and their westward spurs is similar except that the elongated leaves are carried on longer stems and are covered with a very fine pubescence. The flowers are the same rich purple but have a yellow throat instead of indigo. *D. conjugens* from moist places of the intermountain country bears paler bird-bills and smaller, narrower leaves. These, as well as others, bloom very early, often being associated with *Erythronium grandiflorum* and the Fritillarias in the first gorgeous spring display which flower-lovers drive hundreds of miles to see. All of them die down quickly and disappear completely after the seed ripens. In the drier soils the only thing left is a tiny crown of almost microscopic size, with a few brittle, dead-looking roots hanging to it. This is particularly true of *D. latifolium*, and I suspect that people receiving these tiny, dried-up-looking things not only despair of success but frequently discard them. Nevertheless they will grow if planted, and, in addition, many, if not all, of those broken, dried-up roots will revive, callous over, and promptly form a new crown. In fact, its chief vice is this habit of breaking into new crowns so readily that it spoils the blossoming effect

for the first season or so after planting. This is a disadvantage in a display garden, but it makes it an easy and valuable plant to establish at the edges of woodlands and meadows in half-shade where plenty of spring moisture is present.

D. jeffreyi and related forms represent the most showy of the other groups. The blossoms are usually paler, the leaves much elongated (linear or linear-lanceolate), and more numerous than in the preceding types, the entire display arising from a larger and more persistent rootstock. These are bog-lovers, later in blooming, and, in the presence of ample moisture, show a tendency to remain green and flower to a certain extent through most of the summer. *D. meadia* of the eastern states is quite similar to some of this group, and *D. alpinum* is, as found in the Cascades, a much diminished *D. jeffreyi*. Both forms are pictured on page 92.

There are numerous other species, particularly in California and the southern end of the Rockies, and while they are of doubtful hardiness some might provide something strikingly different.

DOUGLASIA.

Of these American cousins of the aristocratic Androsace, only one is in general cultivation, *D. lævigata* from the Columbia River gorge and various mountain peaks in the western parts of Oregon and Washington. This Douglasia makes compact, little, stiff-leaved rosettes, each leaf often having several noticeable teeth toward the outer end. The dainty pink

Dicentra oregana has cream and purple flowers above a mass of silver-plated foliage
Photograph by George C. Stephenson

Dodecatheon latifolium, one of the most striking of the genus
Photograph by the Author

Dodecatheon jeffreyi has fine pale pink flowers
Photograph by George C. Stephenson

Dodecatheon alpinum, a diminished form of *D. jeffreyi*
Photograph by U. S. Forest Service

flowers are carried in small, open umbels on short stems, exactly like Androsace. The dark pink form usually cultivated is from the Olympics of Washington and Coast Mountains of Oregon. Satisfactory as it is, there is a clear rosy pink *D. lævigata* from the iron, basaltic cliffs of the Columbia River gorge still more beautiful. It is much slower from cuttings or seeds than its coastal cousin. Like Androsace, Douglasia needs thorough drainage and the cool, north side of a rock to do best; at least the most showy and prosperous colonies I've seen have been on northward-facing cliffs. See page 101.

D. dentata is a woolly little plant with the leaves often ending in three small points, and heads of small violet or purple flowers. It is not common in cultivation, if, indeed, it is found at all in American gardens, and is not as valuable as the preceding. *D. montana* from the high northern Rockies is a tight, compact mass of rosettes with one to three pink blooms on short stems. I have never seen *D. nivalis*. It should be a showy pink-flowered one with somewhat woolly rosettes.

Draba. Whitlow Grass.

Among the almost innumerable Drabas there are many worthless winter-growing annuals and some good alpine perennials with compact foliage and showy sprays of white or yellow flowers. It has always been a source of wonder to me that this group is not more popular with rock-gardeners. Many persons who go into ecstasy over fussy European saxifrages and work

year after year to keep them from indulging in their disgusting habit of going brown and dead in the center as soon as the plant attains decent size, will pass a Draba with scarcely a look or a half-contemptuous, "Oh, yes, a Draba," and never give it a second thought. Yet the tightly packed masses of *D. olympica* or *D. hispanica* are every bit as neat, and their dainty sprays of clear yellow flowers are much more graceful than the stiff, pale stalks of *Saxifraga apiculata* or any of its ilk. Perhaps the Draba is too cheerful and easy.

Among the Americans, *D. lemmoni* is a somewhat coarse yellow-flowered mat of soft, flat leaves from Oregon and California. *D. glacialis* forms compact cushions on the highest screes. The numerous flowers are a pale yellow fading to white.

D. densiflora is very dwarf, with closely packed gray foliage in rosettes and clear yellow flowers which seem to sit directly on the foliage, so short are the stems. The linear leaves are stiff and keeled because of the prominent midrib. *D. glabella* and *D. douglasi* are similar.

Among the fifty or more described species there are certainly others entirely unknown to gardeners that will have real merit once they are brought to the lowlands and taught garden manners. The Rockies are particularly rich in such forms.

EPILOBIUM. Willow-Herb. Cotton-weed. Fire-weed.

These Epilobiums, usually known as Fire-weeds because of their rapid spread over burned areas, are

a race of Evening Primroses with pink flowers, although a few are white and one, *E. luteum*, has a yellow blossom. Mostly they are too tall and weedy, the more vigorous perennial species spreading both by abundant seed and rootstalks. But there are two or three outstanding alpine members of the group that should become valuable in the garden.

E. obcordatum from the high Sierras of California is the most widely advertised of the lot, due largely to Farrer's enthusiastic comments. It is a low-growing mat of narrow leaves arranged oppositely on sprawling stems. On these mats sit comparatively big rose-pink primroses. This tiny Willow-Herb, found on moist rocks and in meadows and where there is a constant subsurface supply of water, will require moraine treatment to do well in the average garden.

An upright form from the timberline screes of the high Wallowas is much like the next species except for darker pink flowers. Since it grows where the ice-water from melting snows perpetually trickles beneath its roots, it may be expected to require similar conditions in the garden. No more definite statement regarding it can be given.

E. rigidum, on the contrary, is found on dry rock-banks and flats in the Siskiyous, spreading a pink haze over the dry wastes from which all other color has long since vanished. Starting into growth much later than the general run of plants in this district, it makes a brave show in an otherwise drab landscape. The leaves are numerous, lanceolate to obovate, thickly powdered with a bluish bloom, and carried

on short stems. At the end of the branches are several big, soft pink flowers of shimmering silk, delicate and dainty beyond expectation in a group that runs so heavily to leafage as Epilobium. The rootstalks are thin and wiry, somewhat difficult to transplant, and, because of their late spring development, almost sure to be a victim of the over-enthusiastic but careless gardener. This plant, because of its beauty and season of bloom, bids fair to be one of Oregon's outstanding contributions to the garden. It will require moraine treatment, and, so far, has proved to be a capricious and fussy beauty.

E. luteum, with bright yellow flowers on one- to two-foot stems, is better-behaved than most, so far as excess leafage goes. It is a high-mountain dweller from Oregon north to Alaska, and is not at present generally cultivated in American gardens. All other Epilobiums yet seen are too weedy or too leafy to be admitted to the rock-garden.

ERIGERON. Fleabane.

In this vast race of big, little, and medium-sized Asters, we must look for the majority of American alpine daisies. Of true Asters we have all too few that are real mountaineers, but Erigeron contains a multitude of them in the highest ranges of the Rockies and Cascades. Few are in cultivation, and it would be useless to catalogue them at all. It is possible that some of these dwarfs would be undesirable, but as a general rule, the wise gardener will take any Erigeron a foot or less high, that is offered,

with the chances ten to one in favor of its being something choice. All of them have yellow discs with ray flowers of white, pink, purple, violet, or bright yellow. In general, the dwarfs are plants of the semi-arid deserts or mountain screes, requiring plenty of sunlight and good drainage if they are to succeed. Many blossom persistently through the summer months, a trait that, taken in conjunction with pentstemons flowering at the same season, will some day help wonderfully in overcoming that dearth of summer color in our rock-gardens. A few of the species now offered occasionally may be listed here with the hope that more will be forthcoming soon.

E. chrysopsidis is a gray-leaved shrub from the deserts and desert ranges of eastern Oregon. In the Steens Mountains it is a compact dome of gray, hairy, linear to spatulate leaves of about one inch, above which are two- or three-inch stems, each carrying a single, fine yellow flower. At lower altitudes it may become a woody, flopping little bush of some six to eight inches which retains a fine gray foliage effect. It is not difficult to grow in cultivation, but so far is almost impossible to propagate. Occasionally it sets seeds in the garden, but, like many another composite from the same district, growing plants from seed is a game of chance. Seedlings of arid-district species will germinate and then promptly damp off regardless of weather, care, or what not. This dainty, clear yellow daisy is much to be desired for the garden as it is a better yellow for July and August than anything now available.

E. linearis might almost be called an *E. chrysopsidis* with violet rays and yellow center. It is likely to be somewhat taller, but otherwise it is the same little gray-leaved shrub of some six to eight inches, with flowers of a different hue. It is found in the same type of country through Oregon, Washington, and Idaho as *E. chrysopsidis*, the two often growing side by side in fine color combination on the dry canyon walls. It has the same summer-blooming habit, and in many ways is the most showy Erigeron yet grown, but to date it has shown the same diffidence about multiplying in the garden.

E. curvifolius, *E. ochroleucus*, and *E. filifolius* are names applied to yellow daisies of the same general habit, and *E. elegantulus* is a lavender-flowered one. *E. compositus*, a plant of the great intermountain plateau, is quite variable. At its best it is a crumpled mass of gray, hairy leaves dissected into linear lobes. Each leaf is divided into three main lobes which in turn are more or less completely divided into three segments. They are all crowded in a basal mass through which push three- or four-inch stems, bearing aloft a single, large, white or pale blue daisy. It is illustrated on page 102.

Rayless *E. compositus discoideus* boasts the same beautiful leaf-cluster, arousing one's anticipation only to disappoint it with dumpy yellowish buttons. It grows with its more beautiful relative, and it has been my luck to produce from seed only the rayless form. Collected plants are not difficult to grow, but, like others of these dwarf Erigerons, they are either

short-lived or else bloom themselves to death in a single season.

E. pinnatisectus is a glorified, more robust *E. compositus*, with leaves more finely divided, from the high Rockies of Wyoming and Colorado. *E. salsuginosus* has beauty of an entirely different character. It is an inhabitant of wet, alpine meadows from Saskatchewan and Alaska to New Mexico and California, varying from a few inches to a foot in height, according to altitude and soil. From a short, thick rootstalk spring a mass of spatulate or obovate leaves. In due time each stem, clad in ovate leaves with a broad, clasping base, pushes up to display an ample violet daisy with yellow center. This is among the most easily grown of mountain Erigerons, and will almost certainly be the first one in general cultivation. It is illustrated on page 102.

Others with similar habit are light blue *E. spathulifolius*, from the Wyoming ranges; *E. coulteri*, more robust, with huge white flowers; *E. superbus* from Utah, with petioled leaves and white or rose-colored asters; *E. incanescens*, violet, from Colorado; *E. glabellus*, with white flowers, an inhabitant of the great plains; and *E. oblanceolatus*, an intermountain species with violet blossoms.

E. poliospermus has been in cultivation a number of times and seeds well, but the seed seldom germinates, at least for me. It is a dense mass of narrow gray leaves two inches high against which many little violet daisies perch on two- to three-inch stems. The effect of the plant is enchanting, but it seems to be

short-lived. However, it blooms throughout the entire summer and is well worth all the trouble it takes to keep it. *E. radicatus*, *E. vetensis*, and *E. nanus* are among others of the same general type. See page 107.

The one easily grown dwarf is *E. glaucus*, an exceedingly common dweller of the cliffs and beaches of the Pacific coast. It is a compact mass of rosettes of rather large, lanceolate leaves, the entire plant often a foot or more across, carrying huge Asters of white, pink, or pale blue on short stems. The discs of these flowers, it must be confessed, are rather large and sometimes dim yellow, but the general effect is good. Given plenty of moisture and good drainage, it will bloom continuously through a long summer season.

This by no means completes the list of Erigerons in the western mountains, but it will, at least, convey some idea of the varied types of dwarfs available, to say nothing of the equally numerous larger ones of value for the perennial border.

ERIOGONUM. Umbrella Plant. False Buckwheat.

To dive at random into the tremendous welter of species and forms of this genus expecting to find anything satisfactory would be hopeless indeed. And yet among the mass of annuals and worthless, weedy perennials there are plenty of worthy plants if anyone is skilful enough to adapt them to garden purposes. No large group of western plants is less known to gardeners at present, but there are few groups with more possibilities. Their summer-blooming habit is worth special consideration as they offer shades of

Dodecatheon dentatum, one of the finest of the western Shooting-Stars
Photograph by George C. Stephenson

Douglasia lævigata, one of the best American alpines
Photograph by the Author

Erigeron compositus, a beautiful desert aster
Photograph by the Author

Erigeron salsuginosus grows in the mountain meadows and on well-watered slopes
Photograph by the Author

yellow, orange, pink and white at a season when color of any kind is at a premium in the rock-garden. June, July, and August are great months for these plants, for they bloom abundantly over a long period.

The genus is exceedingly variable. Disregarding the annuals, there are little evergreen perennial shrubs of a foot or so, tall leafy herbaceous types, and another in which the leaves form rosettes above which rise naked stems carrying the flower-heads. The blooms are most frequently borne in round balls at the tip of bare stems, but there are some with flat clusters and also others with open sprays.

So far, attempts at cultivation have been none too successful, but there is always the hope that next time will be different. Several of the best little shrubby species have thrived for several years, but propagation has been slow and uncertain, and no plant can be considered successfully introduced until it can be regularly increased.

E. nudum has been the outstanding success. It forms more or less distinct basal rosettes of ovate leaves on long stems. The leaves are green above, but densely covered with white hair on the under side. The flower-stalks are one to two feet high and branch into a wide-open umbel of many small heads of tiny, soft primrose-yellow flowers. Somehow, it seems a fit garden companion for the big, filmy lavender sprays of *Statice latifolia*. Like statice, the flowers are papery and persistent and can be cut and dried for everlastings. It is biennial in cultivation or, at most, a very short-lived perennial, but it seeds itself copi-

ously all over the place. It is not weedy, for the seedlings are easily killed by stirring the soil. Illustrated on page 108.

E. umbellatum, a sprawling six- to eight-inch shrub, with oblong evergreen leaves, somewhat woolly beneath, and rounded heads of yellow flowers, has also been fairly good-natured in cultivation. So far, it has refused to grow consistently from cuttings but comes readily from seed, which it produces irregularly.

E. siskiyouensis is a shrubby, gray-leaved thing with rounded heads of soft yellow flowers, red in the bud, on four- or five-inch stems. It grows fairly well in a well-drained spot in the garden, but refuses so far to either set seed or grow from cuttings.

E. douglasi, a tiny woody bush with small, oblong, gray leaves and round balls of yellow flowers, behaves much the same. It is an exceedingly choice and dainty thing, and will be a most distinct addition to summer-blooming rock-plants whenever it decides to quit sulking.

E. thymoides might be called a tiny-leaved *E. douglasi*, with pink or red buds and very pale yellow flowers.

E. ovalifolium is the most striking alpine Eriogonum I have yet seen. Densely silvered by a profusion of short white hair, the oval to oblong leaves on slender stems are crowded about the crown on numerous short branches. The naked, six- to ten-inch stems bear rounded heads of clear, primrose-yellow flowers. The effect is most striking, but so far I have not had much success with it. There is also a form, or a

closely related species, with creamy white flowers. See illustration on page 107.

E. sphærocephalum tenue makes small mats of linear leaves beneath little balls of soft yellow flowers.

E. saxatile. Intrigued by its name, I purchased seeds, hoping to get something especially fine. For two seasons promising rosettes of wide, upturned, leathery leaves, silver plated with short, dense, white hair, were nursed along. In the second summer, flower-stalks appeared, grew up some eight inches, and then nothing happened. And to date I am still looking vainly for blossoms on a plant that resolutely refuses to flower under the conditions I'm able to give it. Such things are exasperating, but uncertainties are, after all, one of the vital factors which make gardening such a fascinating occupation.

There are many, many more Eriogonums, including some most desirable dwarfs from the mountain heights, that I have not yet been able to coax into my garden, and, so far as I know, other people have had no better luck. Hope never dies, and some day someone is going to succeed with them.

ERIOPHYLLUM. Oregon Sunshine.

This cheerful yellow daisy has been widely disseminated throughout the United States by enterprising nurserymen as "Oregon Sunshine." It is a useful and showy plant, of easy cultivation, and therefore of wide use in either the rockery or border. There are two species in cultivation besides several others much like them.

E. cæspitosum. The plant usually offered under this name, with more or less lobed or divided leaves, green above and white woolly beneath, is, in reality, the next species. True *E. cæspitosum*, more woolly, with slightly larger flowers, is a less hardy species from the California coast.

E. lanatum is the correct name of the "Oregon Sunshine" commonly found in gardens. It makes great flopping masses of good foliage and quantities of golden yellow daisies produced so abundantly that they all but hide the leaves. The latter are more or less divided and lobed, being green above and silvery gray beneath. It is easily grown, provided it is given good drainage, and is a most distinct addition to garden plants. Pictured on page 114.

Eritrichium

These tiny, woolly, alpine forget-me-nots are no less impossible in cultivation than *E. nanum*, the jewel that Farrer calls "King of the Alps." Our two species are appealing beyond words in their native heights, but I have never yet been privileged to see one bloom in cultivation. On barren rocks in the highest ranges of the West, enduring the most rigorous climatic variations imaginable, they are at home, and resent fiercely and finally any attempt to grow them under garden conditions. For those interested in learning more about the exquisite appeal of this alpine of all alpines, I recommend Farrer's panegyrics. An unimaginative American cannot hope to equal his extravagant enthusiasm.

Erigeron poliospermus blooms all summer
Photograph by the Author

Eriogonum ovalifolium, a dainty alpine member of a vast and weedy family
Photograph by the Author

Eriogonum nudum, a notable success in gardens
Photograph by U. S. Forest Service

Erythronium giganteum is a fine cream-colored woodlander
Photograph by George C. Stephenson

E. aretioides grows on the peaks of the Wallowas and from there eastward into the highest ranges of the Rockies. Its tiny leaves are closely packed, sometimes as much imbricated as those of *Phlox bryoides*. The entire mass, often less than an inch high, is so densely covered with long gray wool that the leaves are indistinguishable. On the mat sit exquisite dark blue forget-me-nots on short stems.

E. howardi, found in the higher Cascades and the Rockies of Montana, has larger but narrower leaves, more conspicuous flowers, and noticeably less wool. It is equally desirable, but few American gardeners are privileged to see it at home, much less collect and attempt to cultivate it.

ERYSIMUM (CHEIRANTHUS). Western Wallflower.

E. asperum is frequently cultivated, though somewhat tall for the rock-garden. The sweetly scented heads of bright orange flowers are very attractive although they are carried on a somewhat leggy stem. It is a biennial or a short-lived perennial, but seeds itself abundantly when once established.

The most promising members of the genus, from a rock-garden standpoint, are still unknown to American gardens. Among these dwarf, compact-growing perennials, a sharp lookout should be maintained for *E. arenicola*, a six-inch form from the Olympics; *E. nivalis*, with pale yellow blossoms; and *E. amœna*, with brown or rose-colored petals. These two inhabit the higher reaches of the Rockies and all have garden possibilities.

ERYTHRONIUM. Dog-tooth Violet.

Erythroniums, known as Dog-tooth Violets, Adder-Tongues, Lamb-Tongues, and various other names in the eastern states, break into a riot of new colors and new names in the mountain valleys of Oregon, Washington, and California. The coastal country, with its pink, cream, and lavender forms, in addition to the eastern yellow and white, is the Promised Land for Erythroniums. If I could choose only one group of native bulbs for garden use out of the great variety available, my choice would, without hesitation, fall on the Erythroniums. They are of easy culture, hardy and happy in the ordinary garden conditions, and respond better to cultivation than any other group. The one great drawback to more widespread use in rockeries and naturalizing in woodlands is their resentment of being disturbed and the poor show they frequently make the first season after planting. With each passing season, they improve for many years, both in size and number of blooms. Few of the westerners increase by offsets as does *E. americanum* of the eastern states, and hence do not become so crowded that they fail to bloom. They should be planted in partial shade in soil rich in leaf-mold, although they grow in all types of soil. Those from western Oregon and Washington are accustomed to some shade, even in this cool climate, and should be given full shade in sunnier regions. One clump of a dozen planted under a fruit tree in my own garden many years ago grew larger and finer each season until, one spring, over fifty blossoms were open at once.

E. grandiflorum and *E. parviflorum* are distributed over a wide range of country from the summits of the Cascades eastward through the Rockies. In addition to other names, they are known as "Glacier Lilies" in many mountain valleys. *E. grandiflorum* is supposed to have, among other distinguishing characteristics, purple or brown anthers, and *E. parviflorum*, pale yellow to white ones. The distinction seems somewhat doubtful to me, as they grow intermingled in various localities in which the proportions of white- and red-anthered blossoms seem to vary widely in different seasons. Whether this is one or two species, it has butter-yellow blossoms and smooth, shining green leaves. In cultivation they show little tendency to increase the number of blooms per stalk, although their flowers do increase in size. See page 113 for picture of *E. parviflorum*.

E. montanum is the famous "Avalanche Lily" of the timberline parks on Mount Rainier, where it pushes up, almost through the snow, to cover the meadows with dancing myriads of dainty, clear white, orange-centered lilies of comparatively huge size. While the display on Mount Rainier is, perhaps, the most famous, the marvelous masses in the high valleys of the Olympics are equally impressive, and every high peak and volcanic cone in the Cascades boasts its own fairyland when the "Avalanche Lily" is blooming. It has a marked aversion for the lowlands. To date, it has proved intractable, sometimes blossoming once on short stems that barely reach the surface of the ground and then passing on. See page 5.

E. giganteum is an easy-tempered woodlander of the valleys between the Cascades and Coast Range in the northern two-thirds of Oregon and all through western Washington, even to some of the islands in Puget Sound. It has huge, cream-colored flowers and leaves mottled and marbled with green and white. It is one of the largest and finest, and next to *E. revolutum*, the greatest shade-lover of them all. See page 108.

E. citrinum is somewhat dwarfer in stature. It comes from the Siskiyous of southern Oregon and northern California. The ground-color varies from cream to pale yellow, marked with a bright yellow center, and there is often a pink flush or a pink edging to the petals. The leaves are mottled.

E. howellii is very similar, but the end of the pistil is noticeably divided into three parts instead of being clubbed, as in *E. citrinum*.

E. hendersoni, one of the most showy of all, is found in the valley of the Rogue River in southern Oregon. Its lavender to lilac-tipped petals are strongly turned back or recurved. The center of the flower is a deep violet or purple surrounded by a white area of varying width, which gradually turns to the lavender color of the petals. The leaves are mottled in this species also. *E. hendersoni* responds to garden conditions readily. It makes larger bulbs than most others and carries more blossoms to the stalk. Five to seven are quite common in cultivation, and once I had a single bulb that produced thirteen blossoms on a single stem. If left undisturbed over a series of years, the stems and leaves become steadily larger, and a closely

Erythronium hendersonii, one of the largest and showiest of the family
Photograph by the Author

Erythronium parviflorum, a bright yellow Adder-Tongue of much beauty
Photograph by U. S. Forest Service

Eriophyllum lanatum, popularly known as "Oregon Sunshine"
Photograph by George C. Stephenson

Fritillaria pudica, the Yellow Bell
Photograph by C. L. Marshall

planted clump of them in full bloom is one of the bright spots in the early spring garden. See page 113.

It has been interesting to watch the blooming season of these bulbs in Portland. *E. hendersoni* invariably comes first, followed closely by *E. parviflorum*, the two usually in full flower almost simultaneously. *E. citrinum* and *E. giganteum* follow, and pink *E. revolutum johnsoni* comes along at the last. Evidently the blooming period is definitely fixed in these bulbs, and they respond very slowly to environmental changes.

E. revolutum, found in the Coast Mountains of Oregon, Washington, and northern California, has strongly recurved petals and the leaves are heavily mottled. In California it is cream or white, but northward along the coast it becomes pale pink in Coos and Curry counties in southern Oregon, and a clear bright pink with golden anthers in the northern counties on the seaward slope of the Coast Mountains. To me it is an enchanting beauty, the most showy of all. The pink forms are often called *E. revolutum johnsoni*, or *E. johnsoni*, as named by Bolander years ago, while various color-forms have been given nursery names in California.

FRASERA. Columba.

This is a peculiar, rather than handsome genus of the Gentian family. Heavy tap-roots, long, narrow, thickened leaves with white margins, arranged in a basal tuft, with a few reduced leaves on the floral stems, are usual characteristics. The greenish yellow

or pale blue blossoms of familiar species are carried on a stiff spike. Few, if any, are in successful cultivation in American gardens. Some of the plants may live but they do not thrive and, apparently, resent disturbance very much. Some of the names under which they may be offered are *F. speciosa*, *F. albicaulis*, *F. montanum*, and *F. albomarginatum*. They frequent dry, gravelly, and often brushy slopes and require exceptionally sharp drainage. See page 124.

FRITILLARIA. Rice-root.

The Rice-roots are represented in our territory by numerous species, two of which are outstanding. Like many other western bulbs, they require good drainage and protection from mice if they are to become permanent inhabitants of the garden.

F. pudica, known to children of the semi-arid districts as "Yellow Bell," is a very beautiful and choice thing for the rockery. From the flattened bulb, scalloped like a little summer squash, come a few narrow, grass-like leaves and one or more short stems, each carrying one or two, rarely more, hanging, butter-yellow bells. It is this species, mingled with the royal purple of *Sisyrinchium grandiflorum*, that in early spring sheet the scab-rock patches of the inland plateau with great yellow and purple mosaics. See page 114.

F. recurva, a Fritillary of more restricted range, is found in southern Oregon and northern California. It grows twelve to fifteen inches high, usually in the shelter of some gnarled and twisted shrub, and carries an open spray of six or eight (in cultivation

sometimes more) little red and orange bells with smartly recurved edges. Pictured on page 123.

The other Fritillaries of this territory all carry more flattened, saucer-shaped flowers, colored greenish yellow, with brown to chocolate spots and splotches. *F. lanceolata*, the Mission Bell, is the tallest, sometimes reaching to three feet, with lanceolate leaves arranged in whorls. It is illustrated on page 123. *F. atropurpurea* is dwarfer, with scattered, narrowly linear leaves. *F. glauca* from the Siskiyous is still smaller, with a few scattered lanceolate blue-gray leaves. There are others with odd greenish yellow flowers of about the same value.

GALIUM. Bedstraw. Cleavers.

Square-stemmed plants with long, narrow leaves, opposite or in whorls, and small heads of little white flowers are these. Most of them are weeds, and the only one in cultivation is *G. boreale*.

G. boreale is occasionally seen in the gardens of enthusiastic collectors of native plants where its massed leafy stems and comparatively large heads of white, fragrant flowers are not unattractive. It may grow up to two feet, but is usually half that height.

G. andrewsi, a curious, little, flat, woody shrub, with dull yellow flowers and crowded masses of prickly little leaves, much resembles some dwarf woody phlox until it puts forth its inconspicuous flowers. It has the merit of remaining green most of the season, and might make an acceptable foliage plant, except that it is only half-hardy at best.

GAILLARDIA. Blanket Flower.

G. aristata is the only one of this gaudy race of Sonoran composites that has proved entirely hardy with me. It is somewhat smaller than the horticultural varieties, and because of its better balance between leaf and flower, as well as its better-bred appearance, is more suitable for the rock-garden. It is a foot or so in height, has gray leaves, generally oblanceolate in outline but much lobed and cut, and big blossoms with the central disc flowers of purple, and the rays of bright yellow or yellow with a red-purple base. Growing on the plains of the Columbia through to the Dakotas, it is reliably hardy, blooming over a long period of time, and deserves to be much more widely used.

GAULTHERIA. Salal.

The ever-present Salal (*G. shallon*), which covers the ground in woodlands and on open hillsides of the Coast Range, is somewhat too large for any but the largest of rock-gardens. On occasion it will shoot up six feet, although the usual height is nearer two. Its bright, evergreen leaves, one-sided racemes of little pink or white urns, and large blue-black berries all combine to give it a pleasing effect. In addition, the berries have a strictly utilitarian use for making pies and jelly for those who know their value. It is generally regarded as inedible, probably because it is so plentiful.

G. ovatifolia, with large, ovate leaves, and *G. humifusa*, with small, oval leaves, both from the

high Cascades, are miniatures of their larger relative. Both are prostrate, or nearly so, and, except for the difficulty of establishing these contrary plants on anything but their native sod, they are good garden prospects. Strong clumps, cut out with a spade, can be coaxed into growing, but seed, and potted or balled plants will probably be the solution of the problem for easterners to whom they are inaccessible at present.

GENTIANA. Gentian.

The increasing popularity of rock-gardening has created a wide interest in many plant families previously little used or known in American gardens. Among them are the Gentians, which have tried to acquire a monopoly of rich velvety blue in the world of floral color.

G. acaulis, the famed alpine Gentian of Switzerland, and its equally beautiful, if capricious, cousin, *G. verna*, are either present or ardently desired in the garden of every alpine enthusiast. The autumnal display of *G. septemfida* and *G. sino-ornata*, with their huge, velvety blue trumpets, and the fierce blues of *G. farreri* are becoming widely known and much sought by gardeners. Yet many, if not the majority, of these enthusiasts fail to realize that western America has Gentians to offer that are as richly colored and, in the proper places, just as valuable garden plants as anything the Himalayas or the European Alps have to offer. While it is true that no one of the American Gentians has attained the compactness of *G. acaulis*, whose enormous blue trumpets

rise almost out of the ground, there are good colored forms which have a better balance between foliage and flowers than that highly prized alpine.

Undoubtedly the best native is *G. calycosa* and its forms or relatives. In the stark granites of the Wallowa and Salmon River Mountains *G. calycosa* is a compact, neat dwarf of some four to six inches. Each plant consists of many separate stems rising from a carrot-like crown, which is soon split into numerous rather large roots. The stems are well clothed with dainty, rounded leaves and each crowned with a large, open, bell-like flower of deep velvety blue with a white throat. In the richer lava soils of the Cascades it is sometimes a foot high, with the same characteristic leaves and blossoms, but the internodes are somewhat longer and the plant loses some of its charming compactness. In both ranges this species is found in gravelly or talus slopes along stream-banks where the drainage is good, but where water is present in abundance not far below the surface. In the Wallowa Mountains, particularly, it is frequently found in profusion on little grassy flats in the glacial debris about the tiny alpine lakes. In the Cascades I have sometimes found it on steep slopes below the permanent snowbanks where it could obtain the drainage and water conditions it likes best. See page 124.

In the garden, *G. calycosa* is an easy, good-natured species, at least with me, and does well either in the moraine or in a well-drained pocket in the rock-garden.

G. parryi, sometimes described as a separate species,

but considered by other botanists as only a form of *G. calycosa*, is found in abundance in parts of the Washington Cascades. In the rich pumice soils where I have found it, it is taller, with more or less flopping stems, each crowned with five blossoms the size and color of the single flower of *G. calycosa*. In the garden it is rather slow-growing, and in young or newly transplanted plants shows only a single flower instead of the five. In some gardens and some soils apparently it never has more than a single flower. It may easily be a particularly vigorous variation of *G. calycosa*, but in its mountain home, where conditions are ideal, it produces a mass of dark blue unrivaled by any other American alpine. Gardeners who are fortunate enough to be able to furnish conditions suitable to reproduce the floriferousness of its native mountains will find it the most beautiful of all American Gentians. It should be planted in a place large enough to allow space for its flopping mass of eighteen-inch stems, and then left alone.

G. setosa, a *G. calycosa* from the Siskiyous, has narrower, more pointed foliage and blue flowers with white throats, more or less spotted with brown or black. It likes wet feet somewhat better than do some of the others, usually growing on little bogs or hummocks with water running about the base. *Darlingtonia californica* and *Viola occidentalis* are often its boon companions along the azalea-bordered streams and in springy places in these mountains.

Next in value stand *G. oregana*, *G. affinis*, *G. menziesii*, and others of their type. Their half-closed

flowers are clear, deep blue, not quite so dark as in the *G. calycosa* group, and much smaller. *G. menziesii* is found along the Oregon coast, where its recumbent stems, each crowned with one or more clear blue flowers, make a brave show. The long and narrow leaves are arranged in pairs along the stem. *G. orfordi* is a very dwarf form growing on exposed points on the coast, and may or may not be a distinct species.

G. affinis, very similar from a garden standpoint, comes from swampy places in the Cascades of Oregon and Washington and other ranges to the eastward. *G. oregana* is more of a dry-land plant, growing in rich, moist soils about the edge of woodlands and shrubby places in the Blue Mountains of Oregon and Washington. All are of easy culture in ordinary well-drained garden soils, and can be used in the rockery to good advantage where a ten- to fifteen-inch plant is needed.

One other species offered by collectors of the Pacific coast is *G. sceptrum*. To all intents and purposes this is a western Closed or Bottle Gentian similar to *G. andrewsii* of the eastern states. It grows somewhat taller and blooms several weeks earlier than *G. andrewsii* in my garden and has about the same value. Like its eastern cousin, it loves swampy places and can be used to advantage about the pool or in the bog-garden, where deep blues are at a premium.

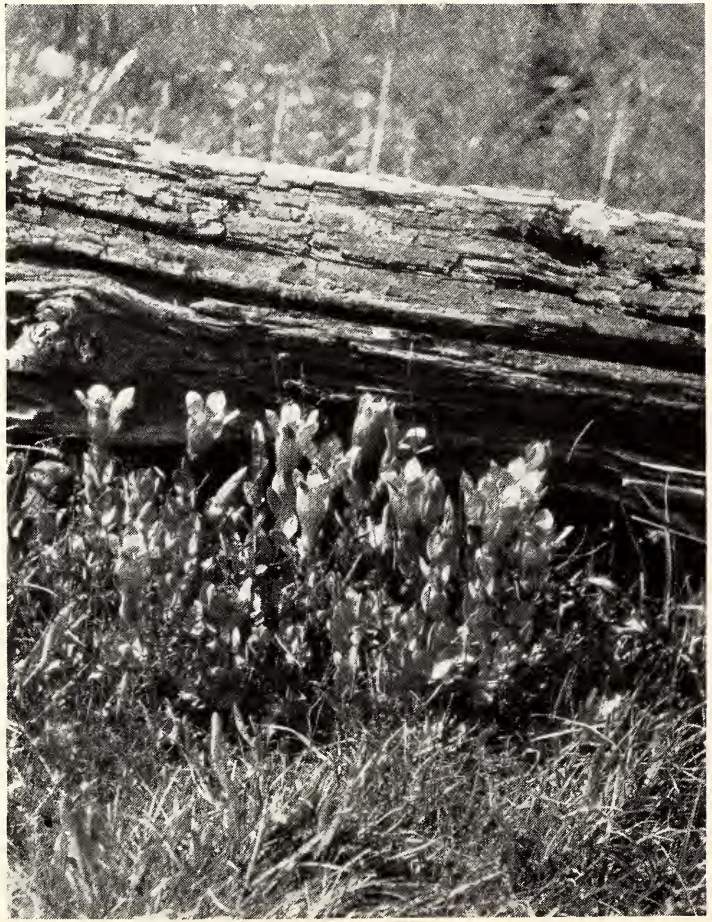
GERANIUM. Geranium.

The gardener looks in vain among western Geraniums for a rival to beautiful *G. argenteum*. Ours are

Fritillaria lanceolata, the Mission Bell
Photograph by C. L. Marshall

Fritillaria recurva, the Red Bell
Photograph by U. S. Forest Service

Frasera speciosa, a strange member of the Gentian tribe
Photograph by U. S. Forest Service



Gentiana calycosa, the best American Gentian, in a particularly good dwarf type. Photograph by the Author

gawky, rather leggy plants with blossoms that are often a peculiarly repulsive muddy shade of purple or magenta. Occasional variations are somewhat more attractive than the natural hues. The common forms may be naturalized in a wild corner where their mass of more or less finely dissected foliage serves a useful purpose.

G. incisum has a clear pink and also a solid white sport which are the best of the lot.

GEUM. Avens.

None of the native Geums that have come my way have aroused any ardent desire to possess them. We must go to the Old World for the showy members of this family, as our natives do not approach *G. montanum* or *G. borisii*. While some Americans have quite satisfactory yellow flowers, they all achieve a legginess and leafiness that effectively spoil their charm.

GILIA.

G. pungens is a queer, freaky perennial among a great mass of annuals and biennials. It is a woody shrub with stiff little branches, decorated by numerous little, spiny leaves held stiffly erect. Many times I saw this apparently useless little bush, six to eighteen inches in height, before I surprised its secret. Then, on the desert plateaus of southeastern Oregon, far to the south of the Steens Mountains, as sundown neared, this prickly little desert hedge-hog opened up its comparatively big, phlox-like flowers of faintest apricot, tinted with the pink of the sunset. In the garden it is a rather forlorn and forbidding

little bushlet, except for the early morning and late afternoon, but it fits into and does its share of beautifying its native landscape. It sleeps when the deserts sleep and seem uninhabited, and opens its showy flowers as activity returns in the cool of the evening. In the garden it demands a hot, dry location if it is to succeed at all.

G. nuttallii, a companion mountaineer from the Cascades of Washington and Oregon, is a similar species, growing at six thousand feet or above, with smaller white blooms having yellow throats. Cantua is a generic name also applied to these odd little shrubs.

GORMANIA.

G. watsoni, a Stonecrop with the petals more or less united into a tube, is a robust plant on exposed rocky ridges at the eastern base of Mount Hood, where it forms great carpets of rather coarse, upturned rosettes, the individual leaves of which are gray, and wedge-shaped. The very pale yellow flowers are borne in lopsided heads on stems four to six inches high. A very similar, if not the same plant, grows in exposed places on the southern Cascades and Siskiyous.

G. laxa from the same southern Oregon territory is similar but bears pink to red flowers.

HABENARIA. Rein Orchis.

A group of erect, leafy-stemmed Orchids growing from fleshy, tuber-like roots and carrying terminal spikes of small greenish yellowish or white flowers.

To date our species have attracted little attention, although they are rather easily transplanted and grown, for Orchids. None of them I have yet seen equals the beauty of the White Fringed Orchis (*H. blephariglottis*) of the eastern bogs, but some of the numerous westerners have a charm worthy of closer acquaintance. *H. leucostachys*, found in wet mountain meadows from California north to Alaska, has an attractive spike of pure white flowers. *H. stricta* has purplish blossoms. *H. sparsiflora*, *H. aggregata*, and *H. dilatata* are other white forms which may in time be offered.

Hesperochiron (Capnorea).

Dwarf, stemless little perennials these, with short, thick roots, crowned by succulent basal leaves and big, open saucers of either white or blue, set almost on the ground amid the leaves. Some have bell-shaped flowers of the same colors. Several varieties range from the Cascades to the Rockies in Idaho, Montana, Oregon, and Washington, and some overflow into California and southern Oregon, west of those mountains. See illustration on page 70.

H. pumilus is the best and is easily cultivated except that it is always difficult to prevent it from being dug and destroyed during its long dormant season. The wide saucers may be white, pink, or pale lavender in the same patch. *H. californicus* is occasionally seen in cultivation. It has smaller white flowers, rather narrower leaves, and comes from wet places of the intermountain country.

HEUCHERA. Alum-Root.

Heuchera belongs to a huge aggregation of leafy Saxifrages having palmately veined, basal leaves and small flowers arranged in simple spikes or open panicles. It is abundantly represented in western forests and mountains by forms which are little different from those of eastern America.

H. micrantha has airy, open, two-foot panicles of small white blooms, and is an attractive inhabitant of shaded banks and cliffs throughout much of the west coast. It is my favorite of all the leafy Saxifrages.

H. glabella from east of the Cascades makes the usual mass of basal foliage, somewhat more lobed than that of other species, and rather large, pale translucent yellow blossoms of a very attractive shade, but the erect, stiff stems have a plantain-stalk appearance that debars the species from attaining first rank as a garden plant.

The numerous other species are much alike and useful only for shaded parts of the wild garden.

HYDASTYLUS. Yellow Star-Grass.

This has now returned to its former home, and will be found as *Sisyrinchium californicum*.

HYDROPHYLLUM. Water-Leaf.

A family with long-stemmed, deeply lobed basal leaves, divided pinnately, and dense heads of pale blue or white blossoms. Each small, bell-shaped flower extends both stamens and style beyond the corolla, giving a woolly appearance to the cluster that is not unattractive.

Iris missouriensis, a tall and easily grown Iris
Photograph by U. S. Forest Service

Iris chrysophylla varies from white to yellow and has proved a most desirable garden plant. Photograph by U. S. Forest Service

Iris douglasiana, a showy Iris from the Oregon coast
Photograph by the Author

Iris gormani, the rarest of Oregon's many beautiful species
Photograph by the Author

H. capitatum, with its pale violet heads on short stems nestled among the leaves, is the only one I have seen in cultivation. It is a common woodlander throughout much of the West, and could be used much more extensively. It is one of those things that have an odd appeal to the few and apparently none at all to the multitude. Its sprawling mass of thick roots are not too easily transplanted, a fact which may partially account for its lack of popularity.

HYPERICUM. St. John's-Wort.

In the mass of weedy St. John's-Worts that afflicts America, in common with much of the rest of the world, there seems to be only one native with any garden value, and that is *H. scouleri*. In the high alpine meadows it is a tiny bush of some six to ten inches, with small, opposite, somewhat clasping, ovate to elliptical, silvery leaves and small cymes of bright yellow saucers. The buds are often brilliant red, and the mass effect of the red bud and clear yellow flower is striking. It spreads slowly by underground rootstalks and has shown little disposition to become weedy. In common with other species in cultivation, its only fault is the persistence of the withered flower-parts, which gives it a somewhat untidy appearance toward the end of the blooming period. It seems to thrive in any well-drained garden soil, sharing the easy disposition of its many relatives.

IRIS. Flag.

The West is rich in Irises which rank high in beauty among the members of this striking family. Belong-

ing to the wire-rooted group, they are by no means as easy to establish as those with bulbs or rhizomes, but their beauty is so great that almost any effort to get them established is justified.

Collected plants of many species are hopeless. Their long, wiry rootstalks run far and wide, only occasionally stopping to throw out a few sketchy root-hairs, and cannot be transplanted at all readily. When once established in the garden, either from seed or obtained from collectors who have kept transplanting to compel the formation of a compact root-system, they are by no means impossible. Such well-rooted specimens are now becoming available and are worth many times the price of collected plants.

I. missouriensis, which ranges from the Cascades eastward, is the tallest and most easily grown. Naked flower-stalks up to two feet high carry two white or pale blue, crestless blossoms, veined with darker blue. The leaves are narrow and somewhat shorter than the flower-stalk. It is a lover of ground that is amply watered, at least through the blooming season, although it may bake to the hardness of concrete later. See illustration on page 129.

I. bracteata from the dry, open, yellow-pine forests of the Siskiyous has long, leathery, evergreen leaves and dark yellow blossoms netted and veined with brown. There are usually two flowers on each of the six- to ten-inch stalks. This Iris varies less than most of our others, and requires some shade and drainage to do its best. A similar statement could be made about the following species.

I. chrysophylla, *I. californica*, *I. macrosiphon*. These names seem to refer to the same plant or to plants so much alike that for garden purposes they are identical. It is the most compact, low-growing species of the lot and altogether desirable. Amid a mass of long, narrow, stiff grass-like leaves, the big flowers sit on short stems. One to three buds may perch on each stem, opening into big, flat flowers which vary in different localities from white to pale lemon-yellow, but in any case veined and reticulated with fine blue or brown lines. Illustrated on page 129.

I. douglasiana. Along the coast of southern Oregon and California we find this showy Iris. It bears comparatively huge flowers of various colors amid great masses of thick, leathery, evergreen leaves. Although hardy in Portland, this species is doubtful in the eastern states, a most regrettable weakness, for no western Iris offers greater possibilities for developing color-forms by selection. Its usual color is blue or purplish, the outer segments often being white, veined with purple. There is an ivory-white form of unbelievable purity, with a splotch of clear golden yellow on each petal, and a soft blue of a peculiar but pleasing tone that I have yet to see duplicated by any other flower. All of them offer attractive possibilities if the color variations can be preserved and multiplied. Pictured on page 130.

I. tenax, one of the narrow, grass-leaved Iris, is found from British Columbia to southern Oregon, west of the Cascades. It is the most easily grown of the group, and, like the preceding, varies remarkably

in color. Each flower rises on its own stem among a drooping mass of grass-like foliage. They vary from orchid-lavender to purple, but there are lemon-yellow forms and others dark, almost navy blue, which may or may not hold their color when transplanted. Unlike *I. douglasiana*, which is apt to show all the possible colors in a single field, *I. tenax* generally varies by locality. In any color it is a most lovely thing suggesting a miniature Japanese Iris on a six-inch stem. See picture on page 135.

I. tenuis, one of the rarest native Irises, is found only at the headwaters of the Clackamas and Molalla rivers in western Oregon. There it grows in gravelly or rocky bottoms in the dense shade of a mixed growth of coniferous and deciduous trees, the wiry rootstalks rambling far and wide, stopping occasionally to send up a tuft of wide leaves and a single stem bearing two small white flowers, striped and blotched with yellow and purple. It is pictured on page 135.

First attempts at cultivation were rank failures, but when once established under garden conditions, it proved a delightful surprise. Cultivated plants are easily propagated and exceedingly floriferous, much more showy than the best plants seen in the wild. In the garden it forms clumps which frequently have a dozen blooms at one time and keep producing new flowers for several weeks.

I. gormani, about which systematic botanists have disagreed, has been purposely left until the last. Whether it is distinct or only a form of *I. tenax* (probably the latter) is no particular concern of the

Iris tenax, a variable and lovely flower like a miniature Japanese Iris. Photograph by C. L. Marshall

Iris tenuis, which has accommodated itself admirably to rock-gardens. Photograph by C. L. Marshall

Great mats of *Juniperus communis nana* surround the bases of the grotesque wind-carved pines. Photograph by the Author

Leucocrinum montanum, the Sand Lily, suitable for a choice spot in the rock-garden. Photograph by the Author

gardener. It is found only in a small area in the Coast Mountains of Oregon and is the most dainty and appealing of all native Irises. Resembling *I. tenax* in form, the fine blossoms are soft yellow or creamy white with a golden throat. The foliage is grass-like and abundant, and no one of the wire-rooted Irises is more at home in the garden when once established. It does not come entirely true to color from seed, at least in Portland, where it has every opportunity to cross-pollinate with the abundant native *I. tenax* and must be propagated by division. Nevertheless, one planting of garden-grown seed produced over ninety per cent true colors among the seedlings which bloomed the second season. This indicates that producing seed which will come true is not impossible. See page 130.

ISOPYRUM. False-Rue.

I. stipitatum is a rather inconspicuous but dainty elf of some three to four inches, with two or three finely divided leaves and small, white, anemone-like flowers. In fact, it might be described as a tiny, ragged-leaved anemone for moraine or well-drained spots in the rock-gardens of those to whom balance of flower and foliage have an appeal. *I. halli*, a larger and coarser edition of *I. stipitatum*, lacks the appeal of daintiness possessed by the first species.

JUNIPERUS. Dwarf Juniper.

Juniperus communis, *J. communis montana*, *J. nana*, and *J. sibirica* are some of the names which have been

applied to this dwarf mat-forming alpine shrub. Combinations of these names will also be found. *J. communis nana* is often used by nurserymen to designate a very compact-growing form with blue-gray foliage. This attractive alpine shrub is seldom more than eighteen inches high, in sprawling mats often ten feet across. It has stiff, sharp, dark green or blue-green needles and blue berries. Striking easily from cuttings, it is not difficult to propagate or to grow in open sun. It is found on exposed points along the Oregon and Washington coast as well as on the alpine summits of most ranges. Illustrated on page 136.

KALMIA. Mountain Laurel.

High up in the cold, swampy spots of the Rockies and Cascades can be found a tiny, shrubby cousin of the eastern Mountain Laurel. A foot or less high, with narrow, dark green, leathery leaves, it carries heads of pink flowers only slightly smaller individually than those of its robust relative. *K. polifolia microphylla* is the name applied to this wee shrub, which will grow in lowland gardens if it has enough water, but not around its crown. So far it has been reluctant to bloom with the profusion shown on the mountain heights.

LATHYRUS. Pea.

None of the Perennial Peas are either true rock-plants or alpines, but their sprawling, tumbling mass of vines and showy pea-flowers of yellow, white and purple, and combinations of those colors can become an attractive feature in a large rock-garden.

L. littoralis, a densely silky species with bright purple standards and pale keel, lacks the climbing tendrils of most other species. It is found along the western coast and is one of the best of the family. Among numerous other species sometimes available, *L. maritimus* has purple and white flowers, *L. sulphureus* has yellow blossoms, *L. nuttallii* is reddish purple, and *L. nevadensis*, purple. In addition to these vigorous, sprawling, and climbing species, there are erect semi-dwarfs in the Rockies, some of which are promising gardening material. Among them are *L. sandbergi*, *L. bijugatus*, and *L. ornatus*, all somewhere between six and twelve inches high and all purple-flowered.

LEDUM. Labrador Tea.

These shrubs are closely related to the rhododendrons, and inhabit the cold marshes of the Northwest. They are useful for wet spots in large rock-gardens or in a well-watered shrub-border. Their leathery little leaves and clusters of small white flowers, borne in rhododendron fashion on the tips of the shoots, are quite attractive.

L. grœnlandicum grows from one to four feet high, and both its small branches and the under surface of the leaves are covered with rusty or brownish woolly hair.

L. glandulosum is more robust, up to six feet, and its leaves are silvery white beneath and its flowers somewhat more numerous than the preceding species. Both require plenty of moisture to succeed.

LEPTOTÆNIA.

An exceedingly fine member of the carrot family, known as "Pink Parsley," is occasionally seen in all its glory in the hands of the most skilful gardeners. It deserves to be widely grown and is one of the few native members of this great family about which I can become enthusiastic.

Really, to appreciate *L. purpurea*, one must see the great tumbled piles of basaltic talus in the Columbia River gorge lit up with its ample sprays of dark pink flowers. There it is a noble plant of twelve to eighteen inches, with the foliage dissected again and again until it becomes nothing but a blue-green skeleton of fine and widely separated needles. Above this, the wide umbels make a filmy, flat-topped cloud of pink. A rare cousin, *L. salmoniflora*, from the same gorge, is a miniature *L. purpurea*, and its oddly tinted, salmon-colored spray is only slightly less beautiful than its larger relative. There are other species of yellow and brown tints, but none that approach these in beauty.

LESQUERELLA. Bladder-pod.

These low-growing, yellow-flowered members of the mustard family have foliage densely covered with branching hair and big, rounded seed-pods. *L. occidentalis*, occasionally seen in cultivation, is so densely covered with white hair that it seems to be silvered. The leaves are more or less oblanceolate and usually somewhat coarsely toothed or scalloped. Neither this plant nor any of the other species with which I happen to be familiar are of any great garden value.

LEUCOCRINUM. Sand Lily. Desert Lily.

L. montanum is one of the most beautiful of desert plants. From Nebraska west to Oregon and southward it is abundant in widely separated localities, and often exceedingly scarce in the intervening territories. It is a low, stemless Lily with a short rootstalk and fleshy fibrous roots. Its numerous grass-like leaves and pure white, stemless, sometimes fragrant flowers rest almost on the ground. The Sand Lily, while not difficult in well-drained, sandy, or gravelly soil, seldom flowers well until the second or even the third season after transplanting but after it is established, its dainty, crocus-like blossoms are quite freely produced. Give it a choice place in the rock-garden or moraine away from vigorous spreading rock-plants to see it at its best. Illustrated on page 136.

LEWISIA. Bitter-Root.

These plants are peculiar to western America and deserve to rank toward the top in any alpine list. While some of the species are found over a wide range, the center of abundance is in the Siskiyous. Lewisias, as named in garden books and nursery catalogues, are now quite generally divided by botanists into two genera, Lewisia and Oreobroma. For convenience they will be considered as Lewisias, but the alternate name will be indicated. There is such enormous variation in flowers, habits, and needs of the group that a general statement is of little value and it is necessary to discuss them by sections or individual species.

L. rediviva, named for one of the leaders of the Lewis and Clark Expedition, is now the only rightful claimant to the name Lewisia. Known far and wide throughout the West as Bitter-Root, the State Flower of Montana, it is the most abundant and widely distributed of them all, found alike along stony mountain top and in the desert areas of the intermountain country. At the junction of two or three sprawling, fleshy roots is a short thick crown from which, with the early fall rains, erupts a thick tuft of long, fat, needle-like leaves. In the milder parts of its range, these leaves remain green all winter, dying down as hot weather comes in late spring. After the leaves are nearly, if not entirely gone, the fat, grayish buds appear, opening on sunny days into the most improbable looking blossoms ever to appear on a desert landscape. Huge (for the size of the plant), waxen, waterlily-like flowers, in white or rose-pink, each on a single stem, appear as if by magic when the sun begins to warm the earth, and disappear as quickly and completely at the cool of the evening. Drainage and sun are the prime requisites to grow this showy plant. Illustrated on page 145.

L. (Oreobroma) columbiana is an entirely different type. Its evergreen rosettes of narrow, thickened leaves are attractive in themselves, but when the numerous stems push out from among them and unfold their airy sprays of small flowers, they are exceedingly handsome. The color of the flowers varies according to locality. In the Columbia River Gorge, the Cascades, and in the canyons of the Blue

Mountains, they are white or pale pink veined with dark pink or red lengthwise on each petal. In the coastal ranges grows a rosy purple form with darker red veins and dark green leaves. This variety blooms over a longer period than any other Lewisia and is now finding its way into cultivation as *L. columbiana rosea*. This Lewisia is the best all-round garden plant of the genus. It grows easily and blooms freely in almost any well-drained soil, but shows a marked preference for northern-facing cliffs and rocks. Gardeners, particularly in the eastern United States, should govern themselves accordingly. As far as temperature is concerned, they should be hardy anywhere in northern states, for I have found them growing luxuriantly on exposed cliffs in regions of scanty snowfall where thirty to forty below zero is no novelty.

L. cotyledon, *L. howellii*, *L. purdyi*, and *L. finchii*. Plants offered under these names are very much alike so far as gardeners are concerned. Together with *L. heckneri*, which also belongs close to this group, and *L. tweedyi* (an entirely different plant), they display the most brilliant colors found in the family. All of them belong to the Oreobroma section, and make evergreen rosettes of thick, succulent leaves, and, all except *L. tweedyi*, produce numerous stems of six to ten inches, bearing open heads of many large white or pink flowers with one or more broad, dark pink stripes in the petals. All the species of this general group require some shade in eastern gardens, particularly in the hot part of the day, for they like

northern exposures and slopes, well drained, but also well watered in the early part of the season. *L. howellii* is more or less ruffled at the edges of the leaves. *L. cotyledon* has long, flat, smooth-edged leaves, *L. purdyi* is supposed to have wider bronze or reddish leaves and *L. finchii* is reputed to be the giant of the family. It has been my good fortune to see these Lewisias in their native haunts on many peaks of the Siskiyous, and there is a serious question in my mind as to their distinctness. One can go into many colonies and pick out the types of each and also all sorts of inter-grades between them. If these are distinct species, they certainly hybridize most freely both in the wild and in cultivation, and for all practical purposes they seem to be variations of one species. *L. howellii* is pictured on page 146.

The recently described *L. heckneri*, named for the man who found it in northern California, so far has retained its distinctive character. The edges of the leaves are distinctly serrate, with long, even, fleshy spines, while the blossoms are quite similar to those of the preceding species.

L. tweedyi from the Wenatchee Mountains of central Washington is the royal beauty of the family. Its rosettes of broad, evergreen leaves, widest at the outer end, curl upward after the fashion of the encrusted saxifrages. From among them appear big, pale apricot flowers, the largest in the family, each on a single stem, although not displayed to as good advantage as some of the others.

L. (Oreobroma) oppositifolia is a distinct type. From

Lewisia rediviva, the Montana State Flower
Photograph by C. L. Marshall

Lewisia oppositifolia, a dainty inhabitant of wet spots in the Siskiyous
Photograph by the Author

Lewisia howellii, one of a group of similar Lewisias
Photograph by J. G. Bacher

Lilium bolanderi, a Lily of restricted range in the Siskiyous
Photograph by U. S. Forest Service

its odd, stumpy root come several long, lance-shaped leaves with blunted ends. Above them a six-inch stem carries several large white flowers which, because of the breadth and arrangement of the ten petals, have a curious semi-double appearance seldom found in wild flowers. It grows on wet hillsides in the Siskiyous along with *Sisyrinchium grandiflorum*, *Viola cuneata*, and species of their like, contributing greatly to the floral display of late April or early May. See illustration on page 145.

L. (*Oreobroma*) *leana*, still another of the numerous Siskiyou species, may be said to borrow the foliage of *L. rediviva* and the numerous flowers of *L. columbiana*, although *L. leana's* pale pink blossoms are smaller and borne on shorter stems.

Among remaining species there is little of garden value. *L. nevadensis* has dark green rosettes of narrow leaves from a stumpy root, and white flowers, each on its own stem. The leaves are not evergreen and the petals are so thin that they make only a half-hearted attempt at being white.

L. (*Oreobroma*) *triphylla* comes from a little round corm. It has a single root-leaf, two or three leaf-like bracts on the flower-stem, and small pink flowers.

L. (*Oreobroma*) *pygmæa*, as well as several recently described segregates, is small, fussy, pink-flowered, and of no particular value, even if it does grow.

LILIUM. Lily.

All western American Lilies, save one, are too tall for use in the rock-garden, the exception being *L.*

bolanderi, a low grower from the Siskiyous, with trumpet-like flowers of dull red more or less spotted with brown or black. It inhabits the rocky debris of talus slopes where the drainage is exceptionally good, and must be given similar conditions if it is to do well in cultivation. As it grows only eighteen inches or so high, it can well be used in the rock-garden beneath the spreading branches of some dwarf shrub. Of the other Northwestern Lilies, *L. pardalinum* and *L. pardalinum roezli* (Leopard Lily) are bog or stream-bank Lilies, and *L. occidentale* (Eureka Lily) is a rare and local inhabitant of old sphagnum bogs. *L. bolanderi* is pictured on page 146.

L. washingtonianum (Washington Lily, Mount Hood Lily, Shasta Lily), *L. rubescens* (Chaparral Lily), and *L. columbianum* (Oregon Lily) in its various forms are, by preference, inhabitants of the drier soils and need sharp drainage if they are to succeed permanently. *L. washingtonianum* is pictured on page 151.

LINNÆA. Twin Flower.

L. borealis, daintiest of all woodland perennials, should win the heart of any flower-lover. Everything about it is attractive: the wiry, creeping stems, decorated with rounded pairs of thick, shiny evergreen leaves that become bronzed and empurpled with the winter frosts; the twin trumpets of pink on opposite sides of a short stalk; and last, but not least, the delicious fragrance. It is easily established in the woodland, and if well-rooted pieces are obtained, it proceeds at once to make mats and trace delicate

patterns on the forest floor. It is also suitable for cool, shaded walls and rockwork. If it is not present in the garden, get it and have patience, for, like many other good things, it is not hasty in showing its mature beauty. When it finally becomes established in all its elfin loveliness, if you are not enchanted there is scant hope of your becoming an alpine enthusiast. It is illustrated on page 151.

LINUM. Flax.

L. lewisii has about the same habit and garden value as the already widely grown garden Flax, *L. perenne*. Perhaps it will not blossom over so long a period as its cultivated cousin, but is otherwise very similar in height and habit, as well as color and size of flower. There are one or two similar blue varieties and a number of yellow-flowered species in the higher mountains of Utah and Wyoming, not yet in general cultivation, which may be valuable in the future. It would be well to keep a lookout for *L. sedoides* and *L. kingii*.

LISTERA (OPHRYS). Tway-blade.

Such small woodlanders are quite inconspicuous among the multitude of ground-cover plants. All of them have a pair of oval, or at least ovate, leaves near the middle of the stem and little racemes of tiny orchid flowers, either greenish or purplish, some of which are quite fragrant. It is not difficult to transplant their fleshy roots into suitable shade and duff conditions where they soon help complete the foliage

picture. *L. cordata*, *L. caurina*, *L. convallarioides*, and *L. borealis* are some of the names under which they will be found.

LITHOSPERMUM. Puccoon. Gromwell.

Borages are represented in western America by numerous species, none of which approach in beauty the heavenly blue of *L. prostratum* or the dainty, well-bred loveliness of the tiny shrubs such as *L. graminifolium* offered by Europe. In fact, the center of abundance of our best species is east of the territory covered by this book.

L. canescens, which as a small boy I first knew on the prairies of northwestern Iowa, displays its curious fiddle-heads of bright orange flowers as far west as the Rockies. Its long, thick roots are all out of proportion to the small tops, and perhaps that is the reason it is not more often seen in cultivation. It ranges from eight to twelve inches in height, and its long, hairy leaves are not too numerous or too large to overbalance the flower. It likes well-drained soil and lime.

L. angustifolium, another boyhood friend from the Mississippi Valley, ranges far westward toward the Rockies. It has larger and fewer blossoms of paler yellow than its companion, and similar roots. I have never seen it in cultivation, but it would be a far greater ornament to the rock-garden than many worthless European weeds now offered to American rock-gardeners at fancy prices.

L. californicum from southern Oregon and northern

Lilium washingtonianum, the showiest American Lily
Photograph by the Author

Linnæa borealis is a dainty woodlander from the forest floor
Photograph by George C. Stephenson

Lomatium piperi, known as Salt and Pepper
Photograph by C. L. Marshall

Lysichiton camtschatcense, the Western Skunk Cabbage, is beautiful despite its odor
Photograph by C. L. Marshall

California has numerous stems bearing drooping heads of small yellow flowers with just enough of a green tinge to spoil any beauty it might have. It is sometimes offered in catalogues of western plants.

L. ruderale, with even more green, comes from the great intermountain country.

LLOYDIA. Alp Lily.

L. serotina, the Alp Lily, is a little arctic alpine dweller found in both the Old and New World in the north and in the rocks of the higher peaks of the Rockies, Olympics, and Cascades. It has narrow grassy leaves and small white flowers, either solitary or in terminal racemes. The plant has no special garden value, although it is pretty enough in a rather insignificant fashion. Collectors who desire to grow it will not find it difficult on well-drained soils.

LOMATIUM. Hog Fennel.

These stemless or short-stemmed members of the parsley family bear yellow, white, or occasionally purple flowers, but only a few of them are in cultivation. For some reason, despite their dwarf and compact growth, they seem to have little appeal to the gardeners of America. See page 152.

L. gormani and *L. piperi* are tiny, white-flowered species sometimes called "Salt and Pepper." They are grown in the gardens of wild-flower enthusiasts largely because of their early blooming. The plants are neat and rather attractive and of this large genus are the only species generally cultivated.

LUPINUS. Lupine. Blue Bonnet.

The great Lupine family is one of the major elements in the showy flower-gardens of the mountain slopes. Unfortunately, few are in cultivation and fewer yet are suitable for the rock-garden, although many would be valuable additions to the perennial border. Varying in stature from three inches to as many feet, and from white, pink, and rose to every conceivable shade of blue, purple, and violet, with a few yellow species thrown in for good measure, these west American Lupines offer unlimited garden possibilities, yet almost untouched. Some color-forms of normal light blue species, particularly the ivory and flesh-pink tones, are exquisite, but no one has succeeded in reproducing them. See illustration, page 15.

Of the tiny dwarfs, *L. lyallii* is the only one which I have had in the garden. It is a woolly, depressed rosette of gray, much-dissected leaves, above which rise three-inch stems, bearing compact round balls of exquisite, dark blue flowers with white eyes. It grows at timberline in the high Cascades and is apparently not long-lived, hence the desirability of raising new plants from seed at every opportunity. Except for its short life, it deserves to rank with the best of rock-plants, and is well worth all the trouble necessary to keep it going in the garden. There are many others of this same type of beauty of a foot or less, and it would be well to keep watch for *L. aridus*, *L. breweri*, *L. cæspitosus*, *L. cusickii*, *L. minimum*, and *L. saxosus*. Doubtless there are numerous others of equal value which might be added to this list.

LUTKEA. Partridge-foot.

Under the obscure name of *L. pectinata* is hidden a most interesting little member of the rose family from the timberline parks and glacial screes of the great ranges. It resembles a mossy saxifrage, with foliage more finely cut than the finest of them. The resemblance is so striking that many a western gardener beginning to collect native plants has thrilled at the thought of a new and undescribed mossy saxifrage when the new find failed to match any description in the keys. The little spikes of pale yellow flowers that appear from June to August, according to the altitude and exposure, identify it as a Dwarf Spiræa that makes velvety green carpets yards across on the pumice slopes of the huge volcanic cones of the Cascades. At the height of the season these green carpets are rather sparingly decorated with tiny pale yellow spires of bloom. It is remarkably amenable to garden culture considering the fact that it grows under scree conditions in its mountain home. The plant does best on the cool side of a huge rock, protected from drip, and can easily be struck from cuttings of its semi-woody stems.

LYSICHITON. Skunk Cabbage.

L. camtschatcense, our only representation of this family, is a huge yellow arum known far and wide throughout the West as "Skunk Cabbage," which is in reality a magnificent swamp-plant despite its odor. The great yellow hoods that light up the dark, swampy, wooded bottoms of the coast country in

February and March have a high decorative value. However, the vast root-system debars them from all but the larger bog-gardens. The yellow spathe is followed by great oblong leaves of tropical effect. It is illustrated on page 152.

MAIANTHEMUM (UNIFOLIUM). Wild Lily-of-the-Valley.

Dainty little plants with one to three oval leaves with parallel veins, and tiny spikes of white flowers that vie with *Oxalis oregana* for first place as a ground-cover in the dense fir and spruce forests of the Pacific coast. They require dense shade, plenty of leaf-mold and water. *M. bifolium kamtschaticum* is the name under which this six-inch plant staggers at the present time. Once established in the woodland, it runs about in the leaf-mold, never becoming coarse or losing its well-bred look no matter how rich the soil.

MERTENSIA. Lungwort.

Western America is peculiarly rich in this family. Besides taller species resembling widely grown *M. virginica*, in the great intermountain plateau country there are numerous dwarfs of from four to twelve inches, with pale blue trumpets often enchantingly tinted soft pink in the bud and newly opened flowers. The first sight of a Mertensia-covered hillside is simply breath-taking in loveliness, and there are areas in the Blue Mountains and northern Cascades where the Mertensia display is the equal of any spectacle in the West.

Monardella discolor, a very fragrant Mint
Photograph by the Author

Mertensia longiflora (*M. pulchella*), the most beautiful of its race in America
Photograph by U. S. Forest Service

Mimulus lewisii, a Monkey-Flower with big pink faces
Photograph by U. S. Forest Service

Mimulus guttatus in one of its many variations
Photograph by C. L. Marshall

M. paniculata, a tall species with stout rootstalks, pale blue-green leaves, and comparatively short-trumpeted blue flowers, has about the same garden use and value as *M. virginica* of the eastern states. *M. sibirica* and *M. platyphylla* are forms of *M. paniculata.*

M. longiflora (*M. pulchella*, *M. horneri*) stands at the head of the list of dwarfs. It is unbelievably lovely, with one or two big, ovate, blue-green, basal leaves, and not more than two or three smaller stem-leaves that diminish rapidly toward the hanging clusters of long, pale blue trumpets with crinkled bells. Like the other Lungworts, *M. pulchella* has the trick of showing pink in the bud and often at the base of the earlier flowers. This species has proved to be rather fussy, its thickened almost bulbous root showing a tendency to disappear that is truly astonishing. Again, it will reappear in the most unexpected places in the garden years after it has vanished from a given spot. Its beauty is so great, however, that no trouble should be too great to get it established under moraine conditions. Illustrated on page 157.

M. nutans is similar, with narrower leaves and a more fibrous root system. *M. oblongifolia* has still longer and narrower leaves. *M. foliosa* (*M. brachycalyx*, *M. linearis*, *M. cusickii*) is a similar dwarf with much shorter flower trumpets. In addition, numerous others which I have not seen are reported, and any dwarf Mertensia is apt to prove itself a showy, if fussy, morsel for a choice spot in the rock-garden or moraine.

MICROMERIA. Yerba Buena.

M. chamissonis (*M. douglasii*), the "Yerba Buena" of early Californians, is a fragrant, creeping, little mint with small, ovate, opposite leaves and tiny blue and white flowers in the axils of the leaves. It has value as a ground-cover in woodlands, particularly over vigorous bulbs, but should by all means be kept away from plantings of choice things if they are expected to survive.

MIMULUS. Monkey-Flower.

Monkey-Flowers run riot through the West, clothing the wet cliffs with a green mantle, covered at times with yellow, edging the streams and filling the mountain meadows with banners and splashes of bright color. Much of the fame of the alpine gardens of the western mountains rests on the brilliant, long-continued display of these odd-shaped, face-like flowers. Most of the innumerable species and forms are yellow, although there is one pink and one red outstanding, as well as numerous little dwarf annuals of bright colors.

M. cardinalis, first collected and sent to England by Douglas over a hundred years ago, has long been established in European as well as American gardens. In fact, many gardens boast of its presence in blissful ignorance of its nativity in the California mountains. It has narrow-faced, helmeted, bright scarlet and yellow blossoms and sticky leaves.

M. lewisii has somewhat similar sticky foliage, with big, open-faced flowers of soft rose-pink, and

grows some two feet high. It is one of the most showy summer-blooming plants, and, in combination with yellow-flowered varieties, makes the brilliant floral picture in many mountain parks. When in the garden it seems to be quite subjected to blights and diseases and is therefore difficult to keep. In its mountain home it prefers somewhat drier situations than the yellow-flowered species. There is a beautiful pure white form of this sometimes offered as *M. lewisii alba*. The species is illustrated on page 158.

M. glutinosus of nursery catalogues is more properly known as *Diplacus glutinosus*. It is a sticky-leaved, half-woody shrub of the southern Oregon and California coast, some two to four feet high. The blossoms have a peculiar apricot shade quite uncommon in wild flowers, but, unfortunately, it is not entirely hardy.

M. moschatus, the Musk Flower, is a creeping thing with small yellow flowers more nearly symmetrical than others of the family. It is found in wet places in the mountains from British Columbia southward.

M. alsinoides, a tiny annual commonly found on wet rocks in the west coast, perpetuates itself so abundantly that to all intents and purposes it is permanent. It forms little mats of ovate leaves and has small yellow flowers, each with a bright crimson spot in the center of the lower lip.

M. guttatus may be taken as a type of the taller yellow varieties, not because it is any better or any more abundant than *M. dentatus*, for example, but because it is the one most frequently offered in cata-

logues. As a matter of fact, there is a great deal of doubt in my mind as to the specific distinctness of many named forms. The plants vary so much in different soils and conditions that they are an exceedingly confusing lot. All of the larger species are showy, short-lived perennials at home in wet places. Most of them have rather coarse opposite leaves, and many big, open-faced, bright yellow flowers frequently spotted with crimson. When given plenty of water, they furnish an abundance of color over a long period during the summer. *M. luteus* and *M. nasutus* are similar. *M. guttatus* is pictured on page 158.

MITELLA. Bishop's-Cap.

There are numerous western representatives of these leafy Saxifrages useful enough for shaded places. Like others of this family, they have basal leaves and simple spikes of dull-colored flowers. The family ranges from ten to eighteen inches high, somewhat less than Heucheras. *M. trifida* and *M. diversifolia* have small white flowers, while those of *M. breweri*, *M. ovalis*, and *M. pentandra*, among others, are greenish white.

MONARDELLA. Western Horse Mint. Mustang Mint.

M. villosa is a very fragrant member of the mint family growing on warm, rocky slopes in southern Oregon and northern California. It has the usual squarish stems, with opposite, entire, oval leaves on short stems, and small, compact, thistle-like heads of purple flowers. In the hot rockslides where it makes

its home, it grows some six to eight inches, doubling its stature in more favorable locations. While it is not particularly showy, it should be desired in every garden because of its strong mint fragrance. *M. discolor* from the Washington Cascades is quite similar, but has somewhat paler flowers, and there are numerous similar species scattered over the West. All of them should be given warm, dry locations in poor soil to keep their attractive dwarfness but should not be too near choice things because of their aggressive tendency to spread by root-runners, a fault quite common to the entire family. See page 157.

Moneses. Single Beauty.

M. uniflora, the little, single-flowered Wintergreen, is one of the daintiest of the woodland sprites. Its tiny, soft green leaves paired or in threes, and its single, nodding, waxen-white or soft rose blossoms are perfect in every detail. Add to its attractive appearance the subtle perfume that pervades the woodlands it chooses to adorn, and there is nothing more to ask of it. Unfortunately, it is not happy under garden conditions, and even the most expert cultivators have failed to keep it very long. From its penchant for growing in half-rotten wood, as well as its ominous family connections, saprophytic tendencies might be suspected.

Montia. Miners' Lettuce.

Along the shaded bluffs and precipices of the Olympics, as far south as the Tillamook district of

Oregon, appears an exceedingly dainty form of *M. parvifolia*, one good thing in the welter of weeds in this group of Purslanes. It clings to the face of gloomy cliffs in mats, with festoons of succulent green foliage liberally sprinkled with clear pink flowers over a long period of time. The plants stay neat and green as long as moisture is present.

It is a good plant for a shaded wall where nothing else will grow, and if, perchance, the parent plant should die, an abundance of seedlings will replace it. The neat mats of little, oblong, pale green leaves are a joy in places where even ferns grow straggly, always provided it is starved to compactness.

ŒNOTHERA. Evening Primrose.

The family of Evening Primroses has been split, assorted, recombined and split again, until it even perplexes some botanists to keep up with the names. How much more confusing this is to gardeners I leave to the reader's imagination. Suffice it to say that one is likely to find his Œnothera now under that name, or Onogra, Anogra, Pachylobus, Lavauxia, Gaurella, Galpinsia, Menolix, Taraxia, Sphacrostigma, or Chylismia. Fortunately, few species are yet in cultivation, so that the puzzle is simplified to that extent. For the sake of clearness, all will be considered here and the newer generic name indicated.

O. missouriensis is a floppy thing, suitable for the rock-garden, with long, lanceolate leaves and enormous big, bright yellow saucers which appear throughout the summer. One of the best-natured

and most showy of the family, it is also the most reliably perennial of the low-growing forms. It is from the southwest but is included here because of its hardiness.

O. (*Anogra*) *trichocalyx* forms a tangle of half-drooping twelve- to eighteen-inch stems decorated with numerous narrow, more or less scalloped and indented leaves, and bearing an almost endless succession of big, pale pink or white, sweetly scented saucers. From the Dalles of the mighty Columbia eastward, the sand-dunes and drifts alike are banked knee-deep in tangled masses of this fragrant Evening Primrose. The long runners extend for yards without so much as a trace of a root, but rooted pieces once secured, it is easily established and apparently for good. It is reputed to be biennial or at best a short-lived perennial, but it leaves abundant growing tips or husky seedlings to take its place. It has been with me for years now, always a mass of bloom during June and July when many other rock-plants are fading.

O. (*Anogra*) *pallida* is a more compact, perennial plant with coarser foliage and somewhat large, clear white flowers, at times delicately flushed with palest, pearly pink. It is a very desirable species requiring plenty of hot sun and perfect drainage.

There are many others in Anogra and also in Pachylobus as yet untried that sound most interesting, and whenever they emerge from purely botanical descriptions to become living things in the garden, should add to the attractiveness of rock-gardens in

midsummer. Those with clear, translucent white or pale pink flowers offer the most inducements to the gardener, but, unfortunately, many of the best are not reliably perennial.

Olsynium grandiflorum. Purple Star. Grass Widow.

This is listed among the Sisyrinchiums.

Opuntia. Prickly Pear.

Anyone desiring to grow cactus out-of-doors will enjoy *O. polyacantha*, a species with incredible, soft yellow flowers springing from the ugly spine-covered, elongated pancakes that make up the body of the plants. It grows profusely in territory where forty degrees below zero is no novelty and one hundred and ten above is of frequent occurrence. Give it good drainage and it will stand any vicissitude, save too much moisture and too rich soil. There may be others of this extensive family as reliably hardy but they are at present unknown to me. See page 167.

Oxalis. Wood-Sorrel.

O. oregana is an exceptionally good Wood-Sorrel from the Coast Mountains of the Pacific slope. Its widely ranging rootstalks send up carpets of pleasantly acid leaves that serve the same useful edible purpose for the small boys as others in various parts of the country. The flowers are large, upright bells of clear white or enchanting soft pink that all too frequently fades away under garden conditions. In the perpetual twilight of the redwood forests of northern California and the equally dense spruce

Sisyrinchium grandiflorum is known as the Grass Widow
Photograph by U. S. Forest Service

Opuntia polyacantha, a Cactus hardy at 40° below zero Fahr.
Photograph by the Author

Pæonia brownii, the only American species of the noble race of Peonies
Photograph by U. S. Forest Service

Pentstemon rupicola is the best dwarf of its race
Photograph by U. S. Forest Service

forests farther north, this charming plant spreads rambling mats among the ferns and over the logs. Its masses of three-parted leaves, illumined by the numerous white faces peering from among them, often offer the only note of cheer in the gloomy forest light. In cultivation it demands plenty of shade, leaf-mold, and moisture, and naught else can make it happy.

O. trilliifolia has somewhat longer flower-stalks with several smaller blossoms on each. It is otherwise quite similar to *O. oregana*.

PACHISTIMA.

P. myrsinites is a low evergreen shrub with small, opposite, leathery leaves and inconspicuous little clusters of greenish white flowers. While it is not difficult to grow and not particularly showy, it is useful enough as a rather dainty evergreen. It grows throughout most of the mountains of the West and belongs to the family containing the bittersweet and widely grown species of Euonymus.

PÆONIA. Wild Peony.

P. brownii, the only native American Peony, is modestly decorative. Its thick, much-divided leaves often have a distinct bluish tinge. The single flowers reveal a peculiar combination of red and dull yellow, barbaric to a degree seldom achieved by even the wildest of our modernistic painters. At that, they are quite effective and attract a great deal of attention, perhaps because of their oddity as much as any claim to beauty. The entire plant is twelve to fifteen inches

high and is propagated exactly like the cultivated forms. It is usually slow to re-establish itself after disturbance, requiring several seasons before again making an effective display. See page 168.

PARNASSIA. Grass-of-Parnassus.

Presumably because there is nothing at all grass-like in their appearance, these attractive bog Saxifrages are widely known as Grass-of-Parnassus. High above their numerous shining green, kidney or heart-shaped basal leaves, are the dainty white buttercups, each swaying on its own stem. All of them are lovers of the wet lands.

P. californica has large, saucer-shaped, white flowers on ten- to twelve-inch stems. My first sight of them dancing over the wet meadows of the Siskiyous was a pleasant surprise. The blossoms were so much larger than *P. fimbriata* that I was not entirely sure of their identity. They looked like single white roses miraculously strayed far from home, and sprinkled over the tops of the ever-present sedges. *P. fimbriata* has much smaller flowers in which the sides of the petals are curiously fringed and frilled into ragged, interlocking segments, producing a peculiar appearance that adds greatly to their charm. Both are easily grown in the bog-garden. Other species from the Rockies and northland are quite similar in general appearance and value.

PARRYA. Parrya.

P. menziesii, an exceptionally good, pink-flowered crucifer, grows from Nevada to British Columbia

east of the Cascades. From a thick, stout crown rise its long, blunt leaves, densely clothed with short, branching hairs. The four-petaled pink flowers, carried in open heads, are very attractive, but its long, whip-like roots make it difficult to move, so that it is not common in American gardens. When obtained, it needs good drainage, like other plants from the great semi-arid interior. Seed offers the best means of establishing it.

PEDICULARIS.

As a rule, the western Louseworts lack so much in beauty that they have little potential garden value. Either the blossoms are small and scattered, or the colors are washed out, indefinite, and unattractive. There is one notable exception.

P. densiflora, the Indian Warrior, is most surprising. Never shall I forget my first view of it in full flower in the Applegate River valley of southern Oregon. As we rounded a bend in the road, the entire open woodland was suddenly illuminated with foot-high tongues of scarlet flame dancing above graceful fronds of fern-like foliage. Eagerly we investigated this brilliant stranger, and more eagerly collected plants which lived for two seasons but never condescended to send forth any of those amazing spikes. The curse of parasitism shadows this family, and, possibly, our Indian Warrior falls under its cloud, although it does have a sturdier look than most of its cousins. It is so showy that it is worth a trial, even if disappointment results. Requires drainage and partial shade.

PENTSTEMON. Beard-Tongue.

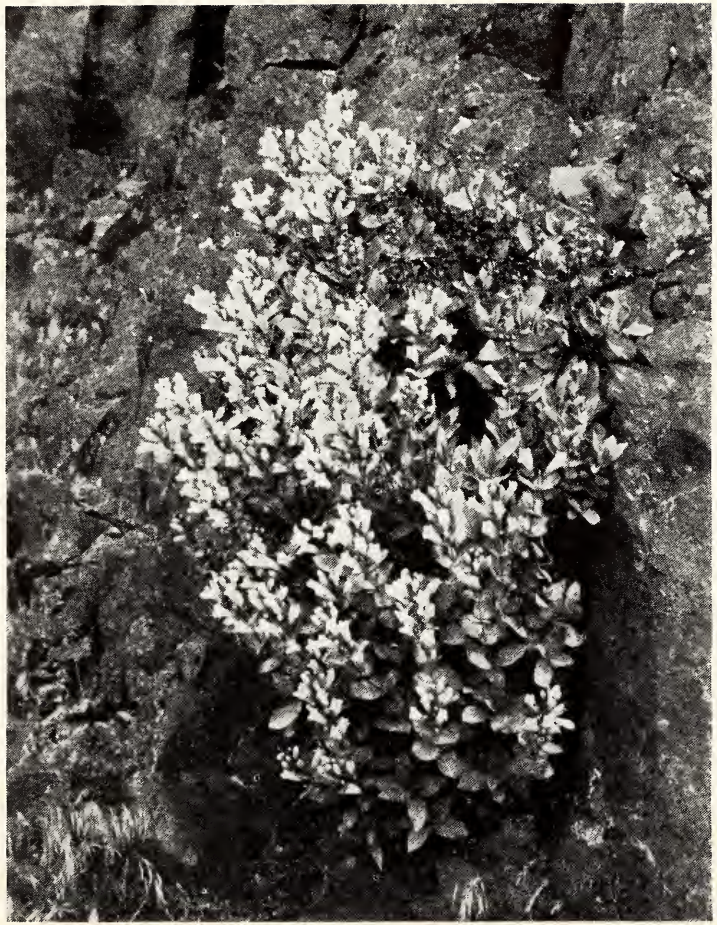
Pentstemons, or Beard-Tongues, have tubular flowers flaring at the outer end into five lobes, two of which are usually above and three below. Four stamens are fertile and alike; the fifth is sterile and different, hence the name, meaning five stamens. This almost entirely American race is a vast aggregate of species containing more potential garden value than any other group of western plants. In such an assemblage, including tiny, rock-hugging species three to four inches high and perennials of as many feet, there are numerous beautiful things, and also many that, for one reason or another, are of little use. In a book of this size no attempt can be made even to list all those of known beauty, and there are many species and forms which are entirely untried and unknown to gardens.

To make it somewhat easier for the reader, those available at this time will be grouped as Dwarf Creeping Rock-Plants, Small Evergreen and Nearly Evergreen Shrubs, and Herbaceous species. This grouping of Pentstemons is far from the scientific or botanical classification which would be entirely too complicated for a book of this character.

With few exceptions, Beard-Tongues require good drainage and plenty of air and light to be entirely happy. There are just enough exceptions to this rule to make it impossible to give definite general cultural directions, and those requiring somewhat different treatment will be discussed in the text.

Pentstemon menziesii davidsonii, a rock-hugging Beard-Tongue from alpine summits
Photograph by U. S. Forest Service

Pentstemon fruticosus cardwellii, the most floriferous of shrubby Beard-Tongues
Photograph by the Author



Pentstemon barrettæ, a beautiful, shrubby species from the Columbia Gorge. Photograph by C. L. Marshall

Pentstemon richardsonii also loves the iron cliffs of the Columbia Gorge. Photograph by C. L. Marshall

DWARF CREEPING ROCK PENTSTEMONS

There are not many in this group at present available. Of them, *P. rupicola* is the garden gem. It is a mass of tiny, leathery, blue-green, ovate leaves on creeping, woody stems sprinkled with short flower-stalks bearing one to several clear dark pink or red trumpets of amazing size and beauty. The entire mass may be less than three inches high on barren timberline cliffs, or twice that on the better drained and richer talus slopes lower down. I have found it on a number of exposures and under a variety of conditions through the length and breadth of the Cascade Range. It grows more luxuriantly and blossoms better on northern slopes where it has some protection from the midday sun; and rock-gardeners, particularly in eastern United States where summer days and nights are long and hot, might take a hint from this preference by trying *P. rupicola* on the shady side of a rock. Even at low elevations I have found luxuriant, flower-covered mats in talus slopes almost completely shaded by towering cliffs. Illustrated on page 168.

Next in importance is the variable *P. menziesii*, the value and use of which is largely dependent on the origin of the plants. In the Olympics and on some of the rugged volcanic flows of the Cascades, where it is one of the first flowering plants to become established, it clings to the face of the rock with the persistence of a lichen. In richer soils it may be a straggling six- or eight-inch bush of no particular

beauty. The dainty, rock-hugging forms are exceedingly slow to propagate, and, consequently, offered in very limited numbers. From the pumice slopes of old volcanic cones comes a form two to four inches high, making a fine mass of yellow-green, leathery foliage covered with a profusion of huge purple trumpets. It is much more floriferous than *P. rupicola* in the mountains, yet strangely shy of bloom in many gardens. *P. menziesii* itself has leaves more or less toothed, while *P. davidsonii* (generally accepted as a form of *P. menziesii*) has no teeth whatever on its little ovate leaves. They have equal value, except to an inveterate collector of species. It is pictured on page 173. Truth compels the admission that some of them have a more or less virulent purple color disliked by many gardeners, but there are many good blues, some exceedingly attractive clear, hot purples, and an occasional almost unbelievable pink or clear ivory-white. These are appearing in western gardens where the plants have been cultivated and undoubtedly will make a more widespread appearance in due time.

The third and last of rock-hugging Beard-Tongues is the tiniest of the lot, *P. suffrutescens*, only occasionally available but mentioned in order that gardeners may be on the lookout for it. This tiny, ground-hugging beauty has wee little leaves less than half an inch long, closely packed on woody stems. On the entire foliage-mass, less than an inch in stature, sit the big, single purple flowers with partially upturned faces. I suspect from the evidence of her-

barium specimens that on rich soil, with plenty of moisture, it might sprawl out enough to lose that compactness which is its greatest charm, a misfortune which overtakes many fine alpine plants.

SMALL EVERGREEN AND NEARLY EVERGREEN SHRUBBY PENTSTEMONS

In this section are found some generally useful, depressed evergreen shrubs six inches to a foot high, and a few gray-leaved desert shrubs, evergreen or nearly so in Portland.

P. fruticosus and all its variations, with an almost interminable list of names, stands at the head of the list. Plants listed as *P. crassifolius*, *P. scouleri*, and *P. douglasii* all properly belong under *P. fruticosus*, although a dainty form of *P. ovatus* is more or less widely known in cultivation as *P. douglasii*. *P. fruticosus*, in the Rockies and the westward spurs in Oregon and Idaho, is a ten- to twelve-inch shrub with lanceolate, finely toothed leaves and clear blue or purple flowers on short stems above the foliage. Well-grown garden plants are often two feet across and well compacted, although it is uncommon to find specimens of that size in the wild. Its major fault is a slight sparseness of foliage which makes it rather leggy at times, a fault which can be corrected by vigorous pruning.

P. fruticosus cardwellii, one of the named forms of *P. fruticosus* from the Cascades, is so much more floriferous that it deserves special consideration. Its

larger, wider, and more abundant leaves distinguish it from typical *P. fruticosus*. It is also the most neat and compact-growing of the group. While *P. fruticosus* from the Rockies is a somewhat shy bloomer, *P. fruticosus cardwellii* simply covers itself with short spikes of ample purple blossoms in June, repeating the performance in a less degree in September, particularly if not allowed to seed in the spring. It has taken kindly to cultivation and can be propagated readily by cuttings. Illustrated on page 173.

P. barrettæ, a beauty from the gorge of the Columbia, is only now becoming known to American gardens. It makes compact bushes covered with dull silver leaves oval in general outline and more or less toothed. The stems and blossoms are much like those of *P. fruticosus cardwellii*, but somewhat larger. It has been interesting to watch the changing appearance of this Pentstemon in Portland; during the winter the leaves gradually become dull green, taking on the silvery sheen again with the advent of warm weather. See page 174.

P. newberryi, from the higher ranges of California, for garden purposes is a *P. fruticosus*, with pink or red flowers and a somewhat greater tendency to legginess.

P. deustus, a sprawling shrub with coarsely notched leaves, has small, yellow flowers with a red blotch in the throat of each but they are often lost in the mass of foliage. On some bare rock-ledge with a southern exposure the entire plant is dwarfed and quite attractive, but in cultivation the foliage and stems develop entirely out of proportion to the floral display.

Pentstemon venustus. One of the latest Pentstemons to bloom
Photograph by the Author

Pentstemon procerus grows in profusion in the alpine meadows
Photograph by the Author

Pentstemon collinus. Photograph by the Author

Pentstemon diffusus. Photograph by George C. Stephenson

P. gairdneri oreganus, a little-known desert shrub from the lava-fields of eastern Oregon and Idaho, is a dainty although somewhat diffident beauty for which it is difficult to recommend cultural conditions to suit its varying whims. It comes from an arid country where it grows in scab-rock patches about the edge of the basaltic lavas. Yet the most luxuriant and showy colony I know is growing in the worst patch of gumbo clay on the entire Pacific coast. This statement is made advisedly after intimate personal contact. Nothing could possibly be worse. The plant itself is a tiny, six-inch woody shrub with narrow, almost linear, gray leaves. The flower-stalks are short and carry two to four or even six dainty, wide-flaring trumpets of soft blue that have mertensia's trick of showing clear pink in opening buds.

P. aridus, only occasionally offered, is a very dwarf *P. oreganus* from Montana, with more or less spatulate leaves sometimes hugging the ground so closely it forms rosettes. The flowers are similar to *P. oreganus*.

P. lyalli from the mountains of British Columbia, Washington, Montana, and Idaho might be called the Willow-leaved Pentstemon. It is a semi-woody shrub with upstanding stems clothed luxuriantly with long, willow-like leaves and crowned with clusters of large purple flowers.

P. laricifolius I have seen only once as a train stopped for a moment in central Wyoming. That once was enough to make a lasting impression. It is a mass of gray-green, linear, almost filiform leaves some six inches in height. The flowers are white to pale

purple on short stems, and it is a greatly to be desired garden plant, particularly in a pure white form. *P. linearifolius* is very similar, with pale purple flowers.

HERBACEOUS PENTSTEMONS

The Herbaceous Pentstemons can be divided into several groups for convenience. A, Crown-forming species; B, Rosette-forming desert species; C, Species forming matted crowns; D, Species with entire or almost entire evergreen or semi-evergreen basal leaves and showy flowers; and E, Species with glabrous leaves and close spikes of flowers.

A. Crown-forming Species.

The latest Beard-Tongues to bloom and, for that reason, destined as they become better known, to take a leading part in providing summer color for rock-gardens and dry walls, belong to a group of deep-rooted cliff-inhabitants now represented in cultivation by *P. richardsonii* and *P. venustus*. Both form semi-woody crowns from which arise numerous twelve- to eighteen-inch stems bearing coarsely serrated foliage and open, terminal racemes of good-sized flowers.

The leaves of *P. richardsonii* are somewhat narrower than those of *P. venustus* and the dentation is not so coarse. The flowers vary from soft, clear pink to purple, a range which offers a possibility for future selection of color-forms much superior to the seedlings now on the market. *P. venustus* is coarser with fine dark blue flowers, but some specimens have a peculiar chalky appearance that is very unattractive. Both

species grow in the gorges of the Columbia and Snake rivers, subjected to extremes of heat and cold as well as drought and wind. They are most commonly found clinging to the face of basalt cliffs, their long, whip-like roots penetrating deep into the rock and crevices. They do not make offsets as do many other Pentstemons, and must be propagated by means of cuttings or seeds, not always an easy proposition by either method. Under such circumstances, collection of satisfactory plants is impracticable, and those desiring them must depend largely on seed or nursery-grown stock. Given good drainage, they should be hardy in any part of the northern United States, as it is hard to imagine more rigorous conditions than those imposed by their native habitat. It is always a source of wonder to travelers, sweltering in the furnace-like heat of July, how any plant can survive, much less bloom on those torrid cliffs. Yet both these species come into bloom at that season and flower almost continuously until fall, decorating the frowning walls with gay splashes of pink and blue. *P. richardsonii* is illustrated on page 174, and *P. venustus* on page 179.

P. triphyllus is a similar species, with small purple flowers, from the Snake River plains of southern Idaho. *P. montanus* in its more robust forms resembles a dwarf *P. venustus*, and its dwarf, compact forms from the Rockies are reminiscent of a giant *P. davidsonii*.

B. Rosette-forming Desert Species.

These are among the most lovely forms of Pentstemons. Only a few are in general cultivation,

although good plants of *P. humilis* or *P. lineolatus* are sometimes available. *P. collinus*, *P. cinereus*, *P. gracilis*, *P. eleganthus* belong here. These are desert or semi-desert species somewhat more easily grown on the humid coast than usual with desert plants. *P. collinus*, for example, forms more or less complete rosettes of dull, gray-green, lanceolate leaves on distinct stems, above which rise six- to eighteen-inch stalks carrying a few dwarfed leaves and open spikes of clear blue trumpets which, like the mertensias, are often pink in the opening buds, changing to soft clear blue as the flowers mature. This group is very beautiful and comparatively easy to handle in well-drained soil, hence any of them will be well worth trying whenever obtainable. They form offset crowns and rosettes rather slowly and can be propagated by division or by seed. *P. collinus* is illustrated on page 180.

C. Species Forming Matted Crowns.

With the exception of dwarfer forms of *P. procerus*, the members of this section are more suitable for perennial borders and large rock-gardens than for small rockeries. A great number of species of this group increase and form mats, as do many garden perennials, by making new crowns on short underground stems.

P. procerus is an almost infinitely variable species, and in its better forms is perhaps the most valuable. The basal leaves are oblanceolate to linear-lanceolate, with rather long stems, and form a quite compact

foliage-mass. Above them balls of dark blue flowers are borne on stems from two inches to almost as many feet high. On the taller forms, compact clusters of flowers are usually found in the upper two or three leaf-axils in addition to the large terminal head. It is doubtless the easiest of all Pentstemons to grow, and also one of the most showy of its type. Scattered from the Rockies to the coast, it breaks up into numerous related species of about equal value. Illustrated on page 179.

Most, if not all, of the plants now in cultivation under the names *P. confertus cæruleo-purpureus* and *P. rattani minor* belong here. The true form of the last is quite a different thing and is discussed in connection with *P. rattani*. *P. procerus minor* is a nursery designation for dwarf forms of *P. procerus* some ten to twelve inches high, distinguishing it from the more leggy eighteen- to twenty-four-inch specimens quite common in gardens.

P. tolmiei or *P. procerus tolmiei*, as the case may be, is an enchanting dwarf of some four to six inches, in every way a miniature of its larger relative, and displaying neat balls of dark blue flowers. It is a timberline plant on the high volcanic cones of the Cascades. *P. procerus* in all its forms tolerates more water than most Pentstemons, often being found in rather damp mountain meadows as well as on the drier slopes above.

P. euglaucus, recently described from the eastern slope of Mount Hood, is for all practical purposes *P. procerus* with dull green or gray-green leaves. *P.*

confertus, from a gardener's standpoint, is a yellow *P. procerus*.

Other species, very similar in appearance and garden value, are *P. californicus*, *P. attenuatus*, *P. pruinosus*, *P. pinetorum*, *P. dayanus*, and *P. gracilentus*. All of them are, in effect, tall, rather leggy *P. procerus* from widely separated localities in the West. Some are now occasionally offered in catalogues and others probably will be from time to time in the future. *P. brevis* is a gray-leaved *P. tolmiei* from the Sawtooth Mountains of Idaho. It is not yet in cultivation.

P. brevifolius and *P. chionophilus* are from the isolated desert ranges of Utah and Nevada. They are not yet in cultivation, but deserve mention here and a place in the garden when they become available. Specimens usually resemble *P. tolmiei*, but I have seen one or two plants of these from dry, rocky summits which have adopted a somewhat superficial resemblance to *P. menziesii* in its most dwarf forms. They might be called *P. menziesii* with little, compact balls of bloom taken from *P. procerus* or *P. tolmiei*. Close inspection of the foliage reveals that the leaves are stalked and elongated like those of *P. procerus*, and that the plant is not so much like *P. menziesii* as it first appears.

P. barbatus and *P. torreyi*, the latter regarded by many as only a variety, are probably the most widely cultivated hardy Pentstemons at present. Their glossy leaves and airy spikes of bright red flowers, with strongly reflexed, three-parted lower lip, need no further comment.

P. diffusus, found on the Cascades from British Columbia to western Oregon, is a rather coarse, leafy species, and not a first-rank garden plant. The leaves are more or less serrate and altogether too large and numerous for properly displaying the rather small blue or purple flowers in leafy panicles. Some of the purple shades it affects are the peculiarly muddy tint despised of gardeners, but there are also clearer tones. Illustrated on page 180.

P. glandulosus is a two- to three-foot plant with coarse, somewhat dentate-hairy leaves and large, bloated flowers of washed-out purple or lavender. It dwells in particular abundance on the eastern slope of the Cascades, often growing in mats of considerable size tucked about the base of the scrub oak brush which is intermingled with the lower forests of yellow pine. It is rather difficult to keep in wet climates and apparently is a short-lived species which objects to winter moisture. Its common form is of little value, but there is a natural, clear pink variation which will be an exceedingly attractive addition whenever it becomes reconciled to garden life.

P. nemerosus, also frequently called *Chelone nemerosa*, is found from British Columbia to California. It is a tall, rather gawky plant with large red or purplish trumpets in a terminal spike or in the upper leaf-axils. The flowers are not displeasing, but the display is so small in proportion to the leaf-mass that the plant has little garden value. It is shade-tolerant to a greater extent than most Pentstemons.

P. ovatus, ranging the northern Rockies and Cas-

cades, is the most valuable of these tall, leafy Beard-Tongues. In the mountains and rocky plains its basal mass of petioled, ovate leaves is not out of proportion to the eighteen-inch stems and heads of clear, dark blue flowers. Numerous plants in cultivation under the name *P. douglasii* properly belong here, the latter name belonging to the *P. fruticosus* group previously discussed. In the valleys of western Oregon and Washington, a taller form with great masses of large, shining, ovate leaves is found. It is a plant of considerable beauty except that the stems are often so weak that they flop about in a most untidy manner before the flowering season is over.

P. rattani is another leafy thing some three feet tall, from the Coast Mountains of southern Oregon and northern California, with rather large, washed-out lavender flowers carried in an open panicle. *P. rattani minor*, as its name implies, is a diminutive form from the Siskiyou Mountains. It has even less value than the original. Both these and *P. ovatus* are more shade-tolerant than the majority of the Beard-Tongues, and particularly in the eastern United States would require shady or semi-shady conditions to survive for long.

D. Pentstemons with Entire or Almost Entire, Evergreen or Semi-evergreen Basal Leaves and Showy Flowers.

It is exceedingly awkward to designate this group in any way. They increase slowly or not at all by offset crowns, so they do not naturally belong with

An exceeding robust specimen of *Pentstemon roezli*
Photograph by the Author

Pentstemon speciosus represents the most beautiful group of Beard-Tongues
Photograph by the Author

Phlox adsurgens tops the list of all dwarf Phloxes
Photograph by George C. Stephenson

Phlox longifolia, a somewhat difficult but beautiful desert plant
Photograph by C. L. Marshall

the *P. procerus* type, and their usually narrow, entire or almost entire, leaves set them off from the serrate-leaved *P. richardsonii* group, although in inflorescence and habit they are nearer to that section than any other. In addition, their leaves are often glaucous or puberulent, in other words covered to a greater or less extent by a fine powder or bloom. Except for the *P. glaber* class to be discussed next, this is the most showy of all the types of Beard-Tongues, and because of their easy cultivation and beauty, probably stand well toward the head of the list.

P. azureus, a plant of eighteen inches from southern Oregon and northern California, is most satisfactory. It is good for three or four years, and ordinarily produces enough natural seedlings to perpetuate the planting. The bluish green, powdered leaves are lanceolate to linear-lanceolate and diminish rapidly in size up the stem, and the flowers open into rather broad, dark blue faces on an open spike or panicle. An old plant will produce many such stalks from a single crown, making an exceedingly effective show.

P. cusickii, *P. cinerascens*, *P. heterophyllus*, *P. roezli*, *P. lætus*, and *P. variabilis* are all somewhat similar, varying from eight inches to almost two feet in height. All are good and deserve a place in the garden when obtainable. In general, the leaves are somewhat narrower than those of *P. azureus*, and are often red or brown on the reverse, particularly in the winter months, a thing to be taken into account in using them for garden purposes. The flowers are clear dark blue of a better shade than *P. azureus*, and

are likewise carried in more or less open spikes. A good specimen of *P. roezli* is pictured on page 189.

P. heterophyllus is the most floriferous for me and, in Portland, retains the least bloom on the leaves; *P. roezli* grows the most easily and is almost equally showy; and *P. cusickii* from the rugged desert plateaus of eastern Oregon and southern Idaho, now coming into cultivation, should be the most hardy.

E. Pentstemons with Glabrous Leaves and Close Spikes of Flowers.

This glorious group of Beard-Tongues is both the hope and the despair of every gardener who has tried them. Of all Pentstemons, they are the most beautiful and most exasperating. No flower-lover who has ever glimpsed their closely packed spikes of huge, open-throated, soft blue trumpets can ever forget them. The dwarfer species belong with Androsace, Gentiana, Phlox, Eritrichium, and Douglasia among the elect of the alpine world, and may not easily be coaxed into dwelling permanently in gardens of any except the most fortunate.

In the first place, they are probably short-lived, even in their native haunts, judging from the almost entire absence of large plants, and, in the second place, they dislike winter wet most intensely. It is comparatively easy to establish small plants in the spring, and enjoy their heavenly blue spires through early summer, but as winter approaches the plants look progressively more and more forlorn until only a few of the sturdiest are left for the second season.

P. glaber might well be taken as the type of this group which is found from the eastern slopes of the Cascades and Sierra Nevadas to the Black Hills of South Dakota, breaking into endless forms as it goes. *P. glaber*, as it now seems to be understood, is limited to the great plains of western South Dakota and eastern Wyoming. It has oblanceolate lower leaves, with the upper ones oblong or lanceolate. The flower-spike is a solidly packed mass of large blue flowers somewhat darker in color than some of the other segregates.

This great aggregation has been worked over, split up, and recombined by botanists until the names are an inextricable tangle. Variations in leaf-shape, height, and arrangement of flowers constitute the most trenchant differences from a floral standpoint, but no effort will be made to describe all of these variations, a job that would require a volume in itself.

P. alpinus may be a compact dwarf of some six inches in its most alpine form, or it may be fifteen inches. In either event, it is a royal beauty of the first rank, with clear blue flowers. *P. albidus* is a similar dwarf with white flowers.

P. acuminatus, *P. angustifolius*, and *P. cyananthus* are others of rather compact stature, while *P. speciosus* and *P. unilateralis* are among the giants sometimes running up to two feet in height. See page 189.

P. cyaneus, *P. strictus*, *P. comarrhenus*, *P. subglaber*, *P. secundiflorus*, and *P. jamesii* are only a few of the other names under which will be found Beard-Tongues of this gorgeous tribe.

All of them require sharpest drainage and some protection from excessive winter moisture if they are to linger long. As an added precaution, it is well to sow the seed, usually produced in abundance, and keep new stocks coming on. For an alpine plant, this may seem to many an excessive amount of work, but the breath-taking loveliness of their showy spikes will be ample reward to any alpine enthusiast.

PERAMIUM. Rattlesnake Plantain.

One plant sure to attract the attention of any gardener tramping the woods, looking for victims of his gardening zeal, is the Rattlesnake Plantain. Its basal group of thick, dark green leaves, blotched and marked with white and strongly netted and veined, is the most striking foliage to be seen in the woodlands whether in Oregon or Quebec. It is too bad that such a promising start should end so disappointingly in the little, plantain-like stalks of inconspicuous white orchid flowers. Those who desire to grow it for its foliage will find it as easy as most orchids are difficult. Given shade and leaf-mold, it is easily established.

P. decipiens is the common western species whose other names are *Goodyera menziesii* and *Epipactis decipiens*.

PETROPHYTUM. Creeping Spirea.

At least two of these very dwarf, prostrate shrubs, with hairy foliage and tiny spikes of white spirea flowers, offer something to gardeners.

Phlox diffusa as it grows in the Cascades
Photograph by C. L. Marshall

A very fine form of *Phlox rigida*, with full-faced flowers
Photograph by the Author

Phlox douglasii has notable value as a crevice plant
Photograph by the Author

Phlox speciosa is usually found growing at the base of some shrub
Photograph by the Author

P. cæspitosum sends its mat of tiny, silky gray rosettes, creeping over high cliffs and rocks in the higher parts of the Cascades and the ranges to the east. It has small heads of white flowers which call to mind the white smartweeds, but in my experience it is a shy bloomer. I have known its little silky gray mats for years, but have seen it in bloom only once, and that in the high Wallowa range. When available for cultivation it should be a distinct addition to garden plants.

P. hendersonii replaces it in the higher parts of the Olympics. It is now beginning to appear in cultivation and will doubtless gradually become available. It may be distinguished from *P. cæspitosum* by the fact that its leaves have three veins while those of the latter have only one.

PHLOX. Phlox.

Phloxes are undoubtedly North America's outstanding contribution to the alpine and rock-plants of the world. At the present time it is an impossible task for any one individual to write a comprehensive survey of the group from a garden standpoint, and these notes are based almost entirely upon my own experience with some members of this very interesting and variable group.

Leaving out of consideration the tall-growing species and southerners of doubtful hardiness, there is still a great array from which to choose.

With the exception of *P. adsurgens*, which will be discussed later, the dwarf westerners are dwellers of

the desert and semi-arid areas or of the screes and cliffs of the alpine summits where they can obtain xerophytic conditions suited to their needs. Soil does not always seem to be of great importance, for they may be found growing twisted and gnarled in some fissure in a cliff or as a luxuriant carpet in a tumbled mass of broken granite or lava at its base. Or the same plant may prosper in a region of eight to twelve inches annual rainfall in the stiffest of gumbo clay. *Phlox douglasii* comes to mind—a species of wide distribution and one as variable as the conditions under which it is found growing.

All of them hate wet feet, but thrive on sunshine and drought. On the deserts, many bloom as the freezing weather ceases, and then in summer turn to a most desolate-looking brown mass of stiffened needles, which become green again with the first fall and winter rains. They sometimes behave with curious inconsistency in the garden. In a bed of plants of *P. douglasii* or *P. rigida*, some will stay green all summer if watered, while other plants will insist on a dormant period, regardless of moisture. As time goes by, some of these desert plants seem to adapt themselves slowly to the evergreen condition which their relatives have already found to their liking in distant parts of their range.

Given soil which is not too rich, and sharp drainage, these Phloxes are not difficult, although by no means easy to cultivate. Some, so far, seem impossible, but it is not improbable that a number of the more desirable will be in general cultivation within a com-

paratively few years. Of them, *P. diffusa*, the most promising of the needle-leaved forms, will almost surely be the first to become generally known. *P. douglasii* and *P. rigida* will also yield fairly readily to the gardener's arts. Of the others many are still fiercely intractable.

Before undertaking a discussion of the Needle-leaved Phlox, there is one dwarf westerner which should be mentioned. When ease of cultivation is considered, as well as color-display and flower-form, *P. adsurgens* easily tops the list. It is found growing in the edges of thickets or half-shaded woodlands in southern Oregon and northern California. Its prostrate stems, set with shiny, ovate to lanceolate leaves (almost evergreen with me) and an abundance of big pink and white flowers, make it an exceedingly valuable garden plant. Give it sharp drainage and either partial shade or full sun, and it will grow more surely than any Phlox except *P. subulata* and *P. amœna*. The blossoms are large and vary from pure white to dark pink, some of them combining white and pink shades more exquisitely than any other flower I have ever seen. Each petal tends toward a white or pale pink ground-color with a brighter pink splash or streak down the center. This Phlox is a most delectable thing and so comparatively easy to grow that it will doubtless be in general cultivation within a few years. Illustrated on page 190.

The Needle-leaved Phlox species of western America with which I have had personal experience can be roughly divided into three groups: First, those with

leaves covered with cobwebby hairs; second, those in which the hairs are either absent or confined to a small area at the base of the leaves; third, taller-growing, more or less shrubby species. This is far from an exact scientific classification, but one which supplies a gardener's needs.

The first group, those in which the leaves are largely or entirely covered with cobwebby hair, includes *P. bryoides*, *P. muscoides*, *P. canescens*, and *P. hoodii*. All of them are high alpine or desert species, covered with a woolly, silvery growth, and not one of them has been really successful in gardens up to this time.

P. bryoides grows as a densely packed mat made up of many tiny stems, each covered with closely packed, four-ranked, tiny ovate leaves, all covered with white wool. Each single stem suggests a tiny barley-head, while the whole effect of the mat resembles a compact, very small, silvery version of *Sedum lydium*. One familiar only with other types of Phlox would certainly never suspect this plant of any such relationship unless he chanced upon it at blooming-time, when the long-tubed, white flowers, perched singly on the stems, proclaim its family unmistakably.

I have tried this plant several times in the garden, so far without success; the dampness of winter seems to be too much for these inhabitants of the cold intermountain country of Utah, Wyoming, and Colorado.

P. muscoides is very similar, except that the corolla-tube is shortened and the leaves are not arranged in

Phyllodoce empetriformis at timberline is one of the most conspicuous alpine shrubs
Photograph by the Author

Polemonium pulcherrimum, a beautiful alpine easily established in the garden
Photograph by George C. Stephenson

Potentilla breweri is an unexpectedly good garden plant
Photograph by the Author

One of America's few Primroses, *Primula cusickiana*
Photograph by U. S. Forest Service

four rows. Otherwise it makes the same compact mats and, so far, has resented my efforts with the same fierce antipathy to cultivation. It is quite possible that young, vigorous plants of either species would prove more amenable in cultivation than the old, woody portions of plants which have been collected heretofore and sent to me by friends attracted by the showy blossoms.

P. canescens and *P. hoodii* are two other members of this arachnoid group, both very much less hairy than the two preceding species. They differ chiefly in that the tube of the corolla in *P. canescens* is about twice as long as the calyx, while in *P. hoodii* the tube scarcely, if at all, exceeds the calyx. In both species the hairy foliage presents a silvery appearance, but much less so than *P. bryoides* and *P. muscoides*. The foliage is not imbricated or closely packed, the needle-like leaves are more widely scattered on the stems, giving the plants a much more open appearance, although each makes earth-hugging mats, sprawling out from woody stems anchored to the rocks and screes with long, whip-like roots characteristic of most needle-leaved forms. *P. canescens* with me has proved not too difficult to grow, but the specimens that survive promptly lose the woolliness which is the strongest point of distinction between that species and those of the much more tractable *P. douglasii* group.

With *P. hoodii* my experience has been somewhat limited, but it has been enough to enable me to say that it is little, if any, superior to the other white-

flowered varieties. All these dwarf cushion Phloxes vary tremendously in the size and number of blossoms, width of petals, and so on. Some consist of widely separated spokes of narrow corolla-lobes, while others of the same species are full-faced with wide-open, imbricated or connected lobes. Needless to say, the latter forms are most desirable for the garden, but until we have a wider choice of cultivated material from which to select, we must necessarily content ourselves with seedlings.

All of this group are slow-growing and consequently correspondingly difficult to propagate from cuttings.

In the second group, or those Phloxes without the arachnoid wool, or at most only a small amount of it at the base of the leaves, are found the needle-leaved species which offer the most hope of success to the average gardener. Of them, *P. diffusa*, *P. douglasii*, and *P. rigida* are in cultivation on the Pacific coast, both in Canada and the United States, and all three are available in a limited way commercially. *P. diffusa* is the fastest growing and probably, all things considered, the best. As its name implies, it shows spreading tendencies. Its wider leaf-needles are borne at greater intervals on sprawling, woody stems, and the flowers vary greatly in color from pure white through delicate lavender to clear pink. It is the most alpine of the group, at its best on old volcanic cones of the Cascades such as Mount Rainier, Mount Adams, Mount Hood, and a score of others. On the slopes of Mount Hood grows one of the most beauti-

ful of all its forms, a very floriferous variety with large flowers of exquisite lavender carrying faint suggestions of darker tones toward the center. *P. diffusa* can be grown by layering and, to a limited extent, by cuttings, and as it grows fast enough when established to make wood suitable for cutting, it will undoubtedly be the first of the Needle-leaved Phloxes to become generally cultivated. Closely related botanically to *P. douglasii*, it is quite distinct, from the gardener's standpoint. See illustration on page 195.

P. rigida is a dwarf, cushion-forming species having large white flowers of exquisite purity (in the best forms) and narrow leaves with strongly revolute margins. It grows slowly from a dense, woody trunk and closely resembles *P. hoodii*, but is easier to grow. Possibly this species could be propagated by layers or cuttings, but it grows so slowly that little opportunity has been offered for experimentation. See page 195.

P. douglasii is a name covering either a multitude of botanical sins or a number of different things. The more one studies it, the less certain he becomes of just what *P. douglasii* is. In various herbariums I have recently seen many specimens supposed to be *P. douglasii* and must confess to more confusion. It usually forms a compact, cushion-like mat of more or less upright little branches, each like a tiny fir-twig with dwarf needles. It may be two inches or a foot high, a glabrate or conspicuously glandular, or even hairy, plant with pink, white, lavender, rich purple, or virulent magenta flowers. The branches are

usually stiff, but there are occasional plants that pile up procumbent branches until they resemble a huge, well-grown plant of *Alsine bauhinorum*. Next to *P. diffusa*, it has, so far, proved the most tractable of the group, and grows quite readily from new-wood cuttings as well as by layering. Most of the plants so far offered are seedlings and, consequently, of uncertain color and form. One runs a chance, it is true, of securing some of the narrow-petaled or muddy magenta forms, but he also has an equal chance to obtain some of the magnificent clear pink forms which are by far the best this species has to offer at present. Illustrated on page 196.

P. cæspitosa, which is quite common in many parts of Oregon, is of doubtful value. The few plants I have succeeded in growing have promptly lost the hairiness which is the only characteristic which might conspicuously distinguish it from pale-colored forms of *P. douglasii*.

P. diapensoides is a beauty with which I have had very little experience, and that unsuccessful. Its closely packed, ovate leaves have curiously thickened margins and a conspicuous midrib. The compact leaf-arrangement in these three-inch cushions almost suggests the rosettes of the better androsaces, while the entire plant is covered with showers of dark pink flowers.

P. alyssifolia is a taller species, with either white or bluish flowers. Both this and *P. diapensoides* are from the Rockies and will doubtless require moraine treatment if they are to be garden successes.

In addition to these there are at least three other western Phloxes, slightly taller in growth, that are worthy of consideration for the alpine or rock-garden.

P. longifolia develops a woody base from which come either upright or flopping stems of a foot or less, each crowned with a cluster of large, clear pink flowers. The leaves are long, narrow, and exceedingly attenuated in *P. linearifolia.* Both are difficult to establish as garden plants, but when once secured are real treasures. They reach their greatest development on northerly exposures in well-drained soil, often growing at the base of sage-brush or other shrubs. *P. longifolia* is pictured on page 190.

As pretty as these plants are, there is an even more beautiful one in the great intermountain plateau. It is *P. stansburyi*, one of the most attractive of all Phloxes. In its most compact form, the long, pubescent leaves are crowded into a six-inch ball carrying gorgeous clusters of big pink blossoms on its surface.

Very similar, but with the sticky leaves signified by its name, is *P. viscida*, found in the eastern parts of Oregon and Washington.

P. speciosa is a shrubby perennial with widely scattered linear leaves. The best forms bear huge flowers of fiery pink with such deeply cleft corolla-lobes as to make one wonder if he is not looking at flowers of *Silene californica* on a twelve-inch bush. Other forms have pale flowers, some bear small flowers, and still others flowers good enough in themselves, but only faintly suggesting the beauty of the best. This species shares with *P. longifolia* the

habit of growing in the base of various shrubs, and is equally difficult to establish in the garden. So far, I have only had enough success with this and many others of this glorious family to keep me trying them again and again. Illustrated on page 196.

A number of *P. longifolia*, *P. speciosa*, and several others have been grown from collected seedlings, but I have, so far, had little success in propagating them in the garden.

PHYLLODOCE. Mountain Heath. Heather.

These low-growing evergreens of the western ranges replace the true Heathers. They are low, much-branched shrubs with tiny, thickly crowded leaves, grooved beneath and arranged alternately. The urn-shaped flowers are carried in terminal clusters. In the garden these plants sometimes grow with exasperating slowness. See page 201.

Of the two, *P. empetriformis*, by far the more common in gardens, has pink flowers and *P. glanduliflora* has blossoms of pale sulphur-yellow. Like Cassiope, they require both drainage and moisture.

PINGUICULA.

P. vulgaris, the Butterwort, is a most curious inhabitant of wet banks and rocks. My first acquaintance with it came years ago while working a precarious way along the canyon of Smith River in northern California. A huge serpentine outcrop with a northern face, dripping with water, was fairly covered with these flowers, in both color and shape

suggesting large violets, standing on short stalks above two or three oval, fat, greasy-looking leaves. Later in the season when the moisture was gone, the Butterworts vanished along with the other ephemeral vegetation dependent on that trickling moisture over the face of the cliff. They require shade and a constant supply of water during the growing season.

POLEMONIUM. Jacob's Ladder.

This is a very fine genus containing one or two of the most showy alpines of western America that are of easy cultivation. The leaves are pinnately arranged, that is, with the lobes or sections arranged on opposite sides of a central stem. This fern-like foliage and the wide, saucer-shaped flowers, which open one after another through a long blooming season, make them front-rank rock-garden plants.

P. carneum stands alone at the head of the list in western American gardens, and I suspect it is equally true in many eastern gardens. Growing some ten inches or half again as high in good soil, its wide-open flowers make a brave display against the foliage mass. Plants of this kind in Portland gardens are a mass of color from early May until well into June. The hue varies greatly. Specimens from the Siskiyous and southern Oregon Cascades have flowers of soft flesh-color faintly tinted with apricot in a most unusual shade. To my mind, these are the most desirable, although rosy tinted forms from the gravelly prairies in the western Olympics are certainly a close second. In the garden this species does well

if given good drainage and partial shade during the hot part of the day, and while not long-lived as perennials go, the plants seed themselves abundantly where they are entirely suited.

P. reptans, the common eastern Jacob's Ladder, with its smaller clear blue flowers, stands next in garden value.

Close to the former two, in ease of culture as well as showiness, stands *P. pulcherrimum*. It has had many names, and there has been much argument about its proper title. Under any name, it has more finely dissected foliage than the others and smaller, open bells of pale china-blue with more or less distinct yellow to orange eyes. Although it comes from timberline or above, this plant seems strangely at home in the garden, and, once established, will promptly send out root-runners to form a thriving colony about the base of some shrub whose foliage is not so dense that it shuts out all the sunlight. Its peculiar odor has earned it the name Skunk Weed in some localities. See page 201.

P. viscosum and *P. elegans* are names as yet unknown to the vast majority of gardeners. Both are applied to dwarfs with exceedingly sticky leaves crowded into curious tufts above which are the sprays of flowers almost as large as those of *P. pulcherrimum*, but held on tiny stems just over the crumpled foliage-mass. *P. viscosum* is found through the Rockies at subalpine elevations, and *P. elegans* is from similar locations in the Cascades of Washington. *P. confertum*, another of this sticky foliage fraternity from

Rhododendron californicum, State Flower of Washington
Photograph by U. S. Forest Service

Romanzoffia sitchensis is attracttve on wet banks in shady places. Photograph by the Author

Saxifraga cæspitosa is the best of the American species.
Photograph by the Author

Saxifraga tolmiei, a queer customer which sulks badly under cultivation
Photograph by C. L. Marshall

high elevations in Wyoming and Colorado as well as the Cascades and Sierras, has blue to violet flowers on somewhat taller stems. These three are somewhat fussy and require sharp drainage and moraine conditions to succeed.

P. occidentale (a western American *P. cæruleum*) is a familiar inhabitant of many gardens. It grows two to three feet high, with a basal mass of ferny foliage and tall stems bearing showy heads of dark blue flowers. The plants are easy of cultivation in any well-fertilized and well-watered perennial border.

POLYGONUM. Knotweed.

Of all the vast race of Knotweeds found in this territory, *P. bistortoides* is the only one commonly cultivated. The remainder are too weedy or too ugly to admit to any garden. This is a slender plant of ten to twenty inches, found in alpine meadows among the grasses and sedges, where its compact, oblong heads of white flowers are conspicuous against the green background. It has a rather well-bred look, quite different from the rampant weediness of its family, and is not out of place in a wet spot in the garden.

POTENTILLA. Cinquefoil. Five-finger.

Although the West is rich in Potentillas, few of them attain the rank of good garden plants. They are either too leafy, too leggy, or too weedy to gain admittance. Most of them are herbaceous, with compound leaves usually composed of five or more

leaflets, arranged either like the fingers of the hand or in pairs along a central stem. The flowers usually look like little, single yellow roses on comparatively long stems. All grow easily under ordinary conditions.

P. anserina is sometimes offered in catalogues. Its beautifully silvered foliage, sprinkled with little pale yellow flowers, is certainly attractive in the marshes and wet places where it abounds, but it is one of the worst weeds when established in a favorable spot, running and ramping through and over everything else. In a dry, sunny spot and poor soil, its feathery, silvered foliage is attractive, but even its unconquerable vigor is not quite sufficient to mature perfect flowers under such alien conditions, although with me it has survived for years in such a location.

In the alpine meadows of the Cascades, *P. flabellifolia* displays three-parted leaves and tall stems of butter-yellow flowers, each petal of which is decorated with a deep orange spot near the base. If its stems were half the height and the basal foliage a little less overpowering, this would be a first-rate thing.

P. villosa, an alpine ranging from Alaska to northern Washington, has silvery, three-parted leaves and pale yellow flowers which are among the largest of western Potentillas.

P. (Dasiphora) fruticosa in its most alpine forms is a shrub of a foot or so, with compound leaves of five to seven leaflets arranged in pairs along a common stem. In the spring it is covered with little golden yellow roses and deserves more recognition as a rock-garden shrub than is usually accorded it.

P. diversifolia has silky basal leaves and pale yellow flowers which sit closer to the foliage than is usual with our Cinquefoils. The northern Cascade form is particularly dwarf.

P. breweri, which comes from a small carrot-like root, is more showy than most, with much-dissected, ferny basal leaves and flopping stems carrying open sprays of bright yellow flowers which are large and showy and produced for months under garden conditions. It comes from the high Sierras of California and is the finest American Potentilla I have seen. Illustrated on page 202.

PRIMULA. Primrose.

Few Primroses have condescended to make America their original home, and the few that have are as yet comparatively little known in cultivation, although American gardens are filled with the more common Europeans and Asiatics. In addition, there are numerous gardeners specializing in this extensive group and successfully growing some of the more difficult ones. All of our natives grow on the mountain heights and require careful drainage accompanied by an ample supply of root-moisture up to the end of the blooming period.

P. suffrutescens from the high Sierra Nevadas is one of the few valuable Americans occasionally available. It is a semi-woody species with thickly set, elongated, glossy leaves and dainty heads of brilliant pink flowers.

P. parryi, found in the higher parts of the Rockies

from Idaho to Arizona, is a showy plant. It makes clumps of dark green, elongated foliage, above which is a cluster of ample rose-purple flowers. Those that I have tried have shown an exasperating and unanimous desire to pass promptly into the great beyond, so that I can say little about its successful cultivation.

P. angustifolia, *P. broadheadæ*, and *P. cusickiana* are very closely related, if indeed they are not races of the same plant. Of the lot, the last is the only one with which I have had any experience. Pushing through the melting snow of the lower slopes of the High Wallowas in late May, after years of attempting to find this dainty mountaineer, I secured plants some three seasons ago. In habit it resembles the dodecatheons, which, indeed, together with *Sisyrinchium grandiflorum*, were its boon companions on the wet hillsides. A basal cluster of small, ovate leaves on short petioles, a short scape, and a dainty head of rich velvety violet flowers, with a most heavenly perfume, combine to make this an intriguing native American. It is an early bloomer, growing on little hummocks and beside small rocks on the hillsides, kept wet by the melting snowbanks above. After the blooming season it quickly dies down with the disappearance of the snow, and those gorgeous hillsides become dried out and thoroughly baked until the fall rains soften the ground. What it will do in cultivation remains to be seen. Although some of my plants are still doing fairly well, they have shown no tendency to become satisfied to the extent of reproducing themselves. See page 202.

Saxifraga rufidula. Photograph by C. L. Marshall

Sedum spathulifolium, a very attractive Stonecrop which prefers a shady place
Photograph by George C. Stephenson

Sidalcea spicata, dwarfest of the Wild Hollyhocks
Photograph by C. L. Marshall

An extra-fine plant of *Silene hookeri*
Photograph by the Author

PULSATILLA. Pasque-Flower.

These plants are now classified among the Anemones.

PYROLA. Wintergreen.

Attractive woodlanders these, with spikes of waxen white or pink blossoms, evergreen leaves, and long, rambling, underground rootstalks that are most exasperating to handle in the garden. Even as cuttings, the foliage will remain green and fresh for weeks or months without a sign of rooting, and it is all too seldom indeed that a well-rooted piece can be obtained. Even the best of the Pyrolas are rarely seen in American gardens because of the difficulty of getting them started and the further difficulty of supplying the exact combination of shade, leaf-mold, and moisture required to keep them happy, and yet, on favorable mountain slopes, they grow by the acre.

P. picta diverges from the rest of the family by bearing thick evergreen leaves, blotched white and dark green above and dull purple beneath, and six-inch, open spikes of waxen, greenish white or purplish flowers. It should be a most distinct addition to any shaded garden if it would only condescend to leave its mountain home in the Rockies or Cascades and obligingly satisfy itself with our artificial conditions.

P. secunda, with a slender stem and white, waxen flowers, mainly arranged along one side of the stem, can be distinguished from other Pyrolas by its long, straight style, which in all other western species (except *P. minor*) curves downward. This distinction

has caused it to be set aside by some botanists as a separate genus, and it is therefore sometimes found under the name *Ramischia secunda*.

P. minor has a short, straight style, small whitish flowers, basal oval leaves, and is found in cool, wooded areas in much of the northern hemisphere. It may sometimes be found under the name *Erxlebenia minor*.

P. aphylla has its leaves reduced to short reddish lanceolate bracts, only occasionally producing any green leaves at all. It is found from British Columbia and western Montana in coniferous woods as far south as California.

P. chlorantha has pale yellowish green, spatulate leaves; that is, leaves wider at the outer than the inner end. It is found both in North America and in Europe.

Other species with pink or purplish flowers and shiny dark green leaves, variously shaped and toothed, are *P. asarifolia*, *P. uliginosa*, and *P. bracteata*, all of about the same value.

RANUNCULUS. Buttercup.

American Buttercups are a vast and, as a whole, a weedy race, having flowers of brilliant yellow but with either coarse foliage or roots of such all-pervading greediness that only the poorest kind of judgment would admit them to the garden.

R. occidentalis, which clothes the roadsides and railway embankments of the Pacific coast with butter-yellow carpets, is by no means the least

beautiful, but there is only one species known to me, to date, that may be tolerated in the choice spots of the garden. This is dainty *R. glaberrimus*, the Desert Buttercup, an early bloomer, abundant in the plains and in the mountain ranges east of the Cascades. In the earliest spring the two or three fleshy, three-cleft leaves and big yellow saucers open wide as soon as the buds are through the ground until the whole countryside seems to be sprinkled with big golden coins lying flat on the earth. Later in the season, both leaves and blossoms develop longer stems, losing the compactness that appeals so greatly in the spring. The plants quickly become dormant when hot weather comes, drying down to a growing crown with a basal circle of short, thickened roots resembling those of certain western violas and dodecatheons.

Judging from herbarium specimens, *R. adoneus* from the mountains of Colorado and Wyoming, and *R. macauleyi* from southern Colorado and northern Mexico, are desirable species of somewhat similar appearance, with larger flowers.

RHODODENDRON.

R. californicum, the state flower of Washington, has large, white, rose, or even purple flowers in terminal clusters above thick, heavy, evergreen leaves. It is a robust shrub or small tree and is more suitable for shrub-borders and naturalizing in woodlands than for the rock-garden. Pictured on page 211.

R. albiflorum is a fussy, smaller species with clusters of one to three white flowers on lateral buds below

the foliage. The oval leaves are thin, one to two inches long, and deciduous. It is a two- to six-foot shrub, growing at or near the timberline from Mount Hood north, and, so far, has defied my efforts to bring it into cultivation. Like some of its timberline neighbors on those pumice slopes, it very decidedly resents any attempt to move it to lower altitudes by promptly passing on, apparently without any struggle to live.

ROMANZOFFIA.

R. sitchensis is an exceedingly attractive member of the Water-leaf family suitable for growing on wet banks in shaded places. It forms dainty masses of kidney-shaped, scalloped leaves on long stems, largely basal, from a semi-bulbous rootstalk. The soft creamy, slightly funnel-form blooms are carried some four to five inches above the leaves in airy sprays. Romanzoffia grows from Alaska to California, both in the higher mountains and along the shore. In the drier sites in which it is found, particularly on shale bluffs along the ocean front, it becomes an enchanting dwarf of some three inches in contrast to its eight- to ten-inch stature in happier circumstances. In any case, it is well worth growing in the garden, having a refined, well-bred appearance that stamps it as one of the true royalties of the alpine world. See illustration on page 211. *R. leibergii* and *R. minima* are alpines from British Columbia and northern Idaho which I have yet to see. Their descriptions are most intriguing, but neither is yet in common cultivation.

Rubus. Blackberry. Raspberry.

R. pedatus, a dainty, spineless, herbaceous creeper, may be found threading its way about in the duff of the higher forests. There are numerous other species described which have creeping rootstalks, low-growing palmately cleft leaves, and white Blackberry flowers on short stems, followed later by showy red berries. None of them is particularly amenable to cultivation, since they insist upon a cool, shaded, well-drained spot with plenty of leaf-mold. While not the most showy plants in the world, they have, in common with many other creeping woodlanders, an appeal all out of proportion to their actual beauty, and, in the cool shadows of the thick spruce and fir forests of the Cascades, certainly add a definite charm to the somewhat austere landscape.

R. lasiococcus is another spineless creeper, while the slender stems of *R. nivalis* are armed with smaller recurved prickles. The numerous other species of Rubus are too robust for admittance to any but the largest gardens.

Salix. Willow.

About the last thing the average American would consider for a rock-garden would be a Willow, and yet, on the summits of many of the mighty ranges are wee, creeping Willows only a few inches high, whose brightly colored twigs are ornamental in winter, and whose soft gray catkins, with golden stamens and tiny leaves, eminently fit them for such use. They are all too infrequently offered and less

frequently seen. Watch for *S. petrophila* with short, broad, rounded leaves, pale beneath, *S. tenera* with stiff, smaller, and narrower leaves, light green on both sides, *S. saximontana* with little oblong leaves and yellow branches, and *S. nivalis* with rounded leaves, dark green above and covered with a white bloom beneath. These creeping, much-branched shrubs, four to five inches high, have all been dwarfed by endless generations of battling the storms of the mountain heights.

SAXIFRAGA. Saxifrage.

Saxifraga is another group of plants in which America must concede superiority to the Old World. We have nothing at all approaching the majesty of *S. cotyledon* and its numerous relatives, no tremendous variety of mossy forms such as Europe offers, and no representative of the Kabschias, to compare with *S. apiculata* or *S. burseriana*. Nevertheless, we do have a few dwarfs worthy of a place in any garden.

S. oppositifolia, the most outstanding one, is not entirely our own as it is found around the globe in northern latitudes, and comparatively few gardens in America have yet grown it successfully. Its dense mass of foliage, composed of a tangled mass of prostrate stems and opposite, blunt little leaves, is, in the proper season, quite covered with masses of rose-purple flowers. It grows sparingly in the mountains of Oregon and Washington as well as in the northern Rockies, and is usually found on a stony slope facing north.

S. bronchialis spreads its tight little rosettes of prickly leaves over high mountain cliffs, particularly those with a northern exposure. On these tiny mats, open, six-inch sprays of small, pure white or pink-dotted white flowers appear in June. At suitable places in the mighty gorge of the Columbia, *S. bronchialis* forsakes the alpine heights and grows in great, sprawling mats almost to the water edge. Its garden requirements are quite similar to many other Saxifrages—drainage and shelter from the heat of the noonday sun.

S. cæspitosa is a dainty little mat of rosettes composed of numerous, closely packed, triangular leaves, the outer ends of which are divided into two to five, usually three, narrow segments. The soft white flowers are carried on slender, delicate stems. Like many other mossy Saxifrages, it burns badly in the hot sun, displaying untidy brown patches in the center of the clumps. It grows under the same conditions and often in the same localities as *S. bronchialis*, and one of the joyous sights of the Cascades is afforded by the great patches of color made by these two plants on well-watered northern exposures. In May, June, and early July, they are superb; in late summer they hang on the rocks as dusty, brown, lifeless masses of debris that miraculously take on new life with the coming of the cool fall rains. See page 212.

S. tolmiei, a curious little plant that looks for all the world like a cross between a sedum and a Saxifrage, is found above timberline on many widely scattered peaks of the Cascades. It thrives best below

some melting snowbank where the roots are bathed in ice water and the foliage exposed to the full heat of the sun, and furnishes one of those curious contradictions of behavior that make the cultivation of alpine plants such a fascinating pursuit. On northern and western slopes of numerous volcanic cones, where soil is pure granular pumice, this plant and *Lutkea pectinata* grow together, and both seem equally at home. But in the garden how different! *L. pectinata*, with me, will grow anywhere and thrive in sun or half shade, while its boon companion of the heights, *S. tolmiei*, refuses to grow or even survive long under any conditions that I am able to furnish. Not that it is any great loss, for its coarse, puffy foliage, reminding one somewhat of *Sedum album*, and the funny little cartwheel flowers of yellowish white are curious rather than beautiful. See page 212.

These four species are the dwarfest as well as the most commonly grown American Saxifrages. There are numerous, somewhat coarse species with dandelion-like rosettes of thick leaves and stout stems which end disappointingly in open heads of small, inadequate flowers. *S. oregana* is typical of this group, and *S. rufidula* is another sometimes offered. See page 217.

SCUTELLARIA. Skullcap.

S. angustifolia, with dainty, eight-inch, half-woody spikes, covered with helmeted blossoms of deep dark blue, effectively contrasting with its basal mass of gray foliage, ranks high among western wild flowers

in sheer beauty. A word of warning may not be amiss, for its thick, white roots grow so rapidly and spread so freely that it may easily become a beautiful pest. Therefore, caution should be used in introducing it, except in the hottest, driest portions in the garden in poor soil. Under these conditions it will grow into compact mats freely decorated with six-inch spikes of clear dark blue flowers that are oddly appealing as individual blossoms and showy as a mass. *S. tuberosa*, from the coast of southern Oregon and California, is more dwarf, and there are others of about the same quality.

SEDUM. Stonecrop.

The Sedums are a confusing lot, and herbarium specimens are usually so fragmentary that they afford little help to a puzzled gardener trying to decide what his collected plants may be. The gardener's state of mind on such an occasion closely approaches my own in starting to write this section. No guarantee as to correctness of names goes with this group, for this is only my present understanding after much painful study. The California species, with which my experience is small, are not included.

These Stonecrops are divided into two groups—the Gormanias, in which the petals are more or less united into a tube, and the Sedums, in which they are distinct. Therefore, if your plant is not to be found here look under Gormania.

S. spathulifolium, found west of the Cascades from British Columbia to California, is not only the best

of the natives but ranks high in comparison with any European or Asiatic yet imported into this country. It is slow-growing and thus lacks the weedy tendency so common to the family. In the most desirable forms of this species the wedge-shaped leaves with the wide part outermost are covered with a gray, mealy bloom. The foliage is arranged in compact rosettes. Flowering stalks are decorated with blunt, fat, little leaves, often tinted with red and bronze, in effective contrast to the showy heads of golden yellow. There is also a type with bright green, powderless foliage which is not so attractive, although ranking well in comparison with many others. Contrary to the widely established belief that all Sedums are children of the sun, this one is at its best on the partially shaded sides of huge boulders and precipitous cliffs. Illustrated on page 217.

S. divergens displays its smaller rosettes on the eastern slopes of the Cascades, adorning them with yellow blossoms, the brilliance of which is dulled by a faint suggestion of green. The leaves are dark green to bronzy red, according to season. *S. oreganum* has fat, little, rounded leaves scattered along its stems. Otherwise it is much like *S. divergens*. *S. douglasii* is taller, with needle-like leaves arranged along the stems until it resembles a lush little fir seedling. The flowers are yellow or yellowish green in the usual one-sided cyme. It is a weedy thing, seeding itself everywhere and doing equally well in sun or shade. *S. stenopetalum*, found far and wide in the great interior ranges, is a variable species which might be

described as a very compact *S. douglasii.* There are forms of it with blue-gray leaves that are particularly good. *S. purdyi* is a shade-loving, flat-growing plant with pale green rosettes, spreading by red thread-like runners on which new rosettes are formed at intervals. The flowers are yellow. *S. rhodiola* (*Rhodiola integrifolia*) is taller, with serrated leaves alternate on the stems and bright purple flowers. It is generally found on the higher mountain peaks and may be four inches high in poor soil and twelve under better growing conditions.

SENECIO. Groundsel.

In all this vast family of weeds, *S. websteri* is the only one known to me that offers any garden possibilities. On the talus slopes of Mount Angeles, in the Olympics, it displays flat rosettes of woolly leaves and comparatively large good yellow flowers on short stems. See page 235.

SIDALCEA. Wild Hollyhock.

The species of this western race of erect Mallows, commonly called Wild Hollyhocks, are so much alike that when a garden has acquired one there is little to be gained by any feverish search for others. The leaves of all are palmately lobed and cleft in a manner like many wild geraniums. The flowers, packed in hollyhock-like spikes, run from white to varying shades of pink, rose, and lilac. Their stems reach three feet, and the plants are chiefly useful in the perennial border, although of some value in large

rock-gardens. Those which I have tried are of easy culture in any garden soil.

S. campestris is the tallest and most robust of the species I have tried, and *S. spicata* is the dwarfest and also has the smallest flowers. See page 218.

SILENE. Catchfly. Campion.

The long and imposing list of American Silenes consists largely of rampers with comparatively small flowers and little or no garden value. Scattered through the list are a few such outstanding beauties as to glorify the entire race and make one hesitate to condemn any Catchfly unseen. In fact, I am always trying new and unknown Silenes in the hope of finding another *S. hookeri*.

S. acaulis is, perhaps, next to edelweiss and *Gentiana acaulis*, the most widely advertised of alpines. Certainly anyone who has seen its compact mats of bright green smothered in myriads of tiny pink stars sitting tight on the foliage will have cause to remember it. My introduction to it came in the wild tangle of rocks and peaks on the backbone of the central Washington Cascades known as the Goat Rocks. My companion and I had worked a somewhat precarious way across the sliding talus at the base of a precipitous rock wall and emerged into a little park at the north base of one of the numerous lava pinnacles that towered about us on all sides. Above, the sheer face of the basalt was sheeted with great hanging masses of *Silene acaulis*, *Saxifraga cæspitosa*, and *Saxifraga bronchialis*, all in full bloom. We sat down

and stared at that riotous mass of pink and white flowers. All day we had been working along the southern exposure where naught but a few scraggly creeping junipers and scattered plants of eriogonum were in evidence, and were entirely unprepared for such a display.

Unfortunately, this plant is reluctant to bloom freely under garden conditions, and the best one can expect is a sprinkling of pink stars over the tight mass of tiny linear leaves. My experience has been that American plants bloom more freely than those raised from European seed, and, since it is generally found in the western mountains, it should not prove extremely difficult to obtain.

S. hookeri and the recently described *S. ingramii* are the gems of the American branch of the family. Both have a deep-set, perpendicular rootstalk, the crown of which is usually two to three inches below the surface. From this root come several or many delicate shoots, each of which, on emerging from the ground, opens a cluster of rather small, lanceolate leaves and one or more huge flowers with deeply cleft and divided petals. The gray leaves of *S. hookeri*, which is seldom more than six inches high, make a most effective background for the salmon-pink flowers of a shade which cannot be duplicated in western alpines. When once happily established, the sprawling stems spread each year over a steadily widening area until the plant becomes one of the most showy things in the garden. When dormant the roots are dry, brittle sticks with a few shriveled root-branches

at the lower end, at which time they can be safely handled, and, when planted in a well-drained, sunny spot, soon begin to show signs of life. See page 218.

S. ingramii, named in honor of Douglas Ingram of the United States Forest Service, who was one of the finest botanical collectors I have ever known, is very similar to *S. hookeri* except that it is somewhat more robust and has even larger flowers of deep cherry-red. When it becomes available for garden use it will undoubtedly take its place at the head of the family.

S. californica is a taller, sticky plant with flopping stems and intense scarlet flowers. *S. laciniata* is a tall Californian with coarse, roughly glandular foliage and deeply cleft flowers of brilliant scarlet, comparable only to that of the most vivid Lychnis. It is rather short-lived and has too much foliage and too few flowers to make much of a garden show, despite its brilliance.

SISYRINCHIUM. Blue-eyed Grass. Grass Flower.

The Grass Flowers, in addition to those with the usual little blue stars, have developed some interesting and beautiful species in this territory. In recent years, botanists broke the old genus Sisyrinchium up into several genera, an action which greatly disturbed our garden nomenclature. For that reason, the far-famed Grass-Widow, which is hard to associate with the little blue-eyed Grass Flowers, will be found in many books under the name *Olsynium grandiflorum*, and the yellow-flowered form from the Pacific coast may be listed as *Hydastylus californicus* or some of its

segregates. Taking the Grass-Widow out of this genus is to take away the chief incentive to discuss it, and it is a great satisfaction that some recent technical classifications of western plants return these two strayed plants to their proper fold.

S. californicum. Under this name we place the golden-eyed Grass Flowers which we have been disturbed to find under Hydastylus in some modern botanies. The plants are little clumps of diminutive iris leaves and rather large (for a Grass Flower) butter-yellow stars that appear over a long period. It is most at home along the shore of the Pacific and of doubtful hardiness in the eastern states. At Portland, it frequently winterkills during freezing and thawing weather, particularly when the fluctuating temperature is accompanied by stiff, drying winds.

S. grandiflorum, the Grass-Widow of school-children, is one of the earliest, as well as the most showy, wild flowers in the vast country east of the Cascades. Here, depending on altitude and season, it spreads a shimmering carpet of royal purple over acre after acre sometime between February and June. Appearing with the clear yellow of *Fritillaria pudica*, it makes an unforgettable color combination. The clumps of narrow, grass-like foliage push up in all the damp spots throughout the great plateau country, giving no hint of the surprising loveliness to follow when those amazing banners of royal purple silk are hung out to the breezes. The flowers, an inch across, with showy yellow anthers, are borne on slender stems which seem scarcely able to support the weight

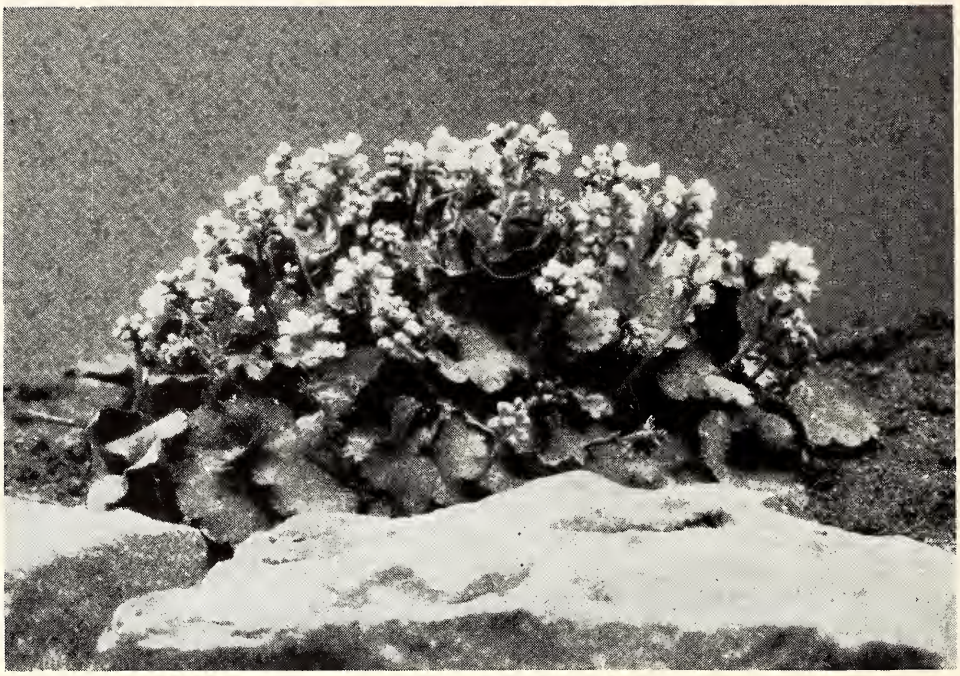
of the great saucers, and, consequently, they are carried in a half-drooping position that detracts not at all from their beauty. There is an ivory-white form of wonderful purity and various pink and rose-colored individuals which, beautiful as they are, do not rival the royal purple of the most abundant type.

It is an easy beauty of undoubted hardiness and as soon as the frost leaves the ground, the Grass-Widow hastens to push its stiff foliage up to the light, anxious lest it be out-distanced by the desert buttercups in the race to be the first flower of spring. In the milder and damper climate west of the Cascades, it often shows its foliage by New Years, taking advantage of the first sunshine to put out a few blossoms as a hint of the glory to come. In its own home it gets a plentiful supply of moisture in spring and in return has to endure a thorough baking through a long, usually rainless summer. See page 167.

S. bellum may be taken as a type of the common Blue-eyed Grass. It closely resembles relatives in the eastern United States with small, pale or dark blue, star flowers carrying a yellow spot at the base of each petal, growing as a tuft of thin, wiry grass-like foliage some eight to twelve inches high, with dainty flowers carried on long stems well toward the top of the clump. It has an especial appeal to children, and at the proper season the little blue stars are to be found in every bouquet of wild flowers. *S. idahoense*, *S. biranium*, *S. macounii*, and *S. segetum* are names applied to similar species, and the last, at least, is in part a synonym of *S. bellum*.

Senecio websteri, a rare Olympic plant
Photograph by U. S. Forest Service

Spraguea multiceps, Pussy-Paws, is one of the neatest alpines
Photograph by C. L. Marshall



Synthiris rotundifolia, a winter-flowering woodlander
Photograph by George C. Stephenson

An undescribed form of Synthiris from the Columbia Gorge
long confused with *S. reniformis*
Photograph by C. L. Marshall

A maritime form of *S. bellum*, with wide, flat leaves, like those of a tiny iris, and comparatively large, dark violet-blue stars with an orange spot at the base of each petal, grows abundantly in damp places along the shore-line of the Pacific, and may not be entirely hardy in the East without some protection in the winter. Except for the doubtful hardiness of this form and *S. californicum*, the cultivation of the group offers no difficulties as all seem willing and anxious to grow in any soils and under almost all garden conditions.

SMELOWSKIA.

These perennial members of the Mustard family produce exceedingly attractive foliage and flowers which, if they appear at all in the garden, are disappointing after the promise of the foliage. The pinnate leaves, more or less thickly covered with gray branching hairs, are clustered about the crown of the thick, branching rootstalks, and the small white blooms are carried in open racemes.

S. calycina, a rather common species, is found in both the Old and New World. American authors sometimes separate the New-World forms as *S. americana*, *S. lineariloba*, or *S. ovalis*, all of which are much alike for garden purposes and answer to the general description. It is found in most of the higher ranges from California to Alaska.

S. fremontii from the desert plateaus of southern Oregon and adjoining parts of Nevada and California is something entirely different. The compact, feathery

gray foliage is composed of linear leaflets arranged in pairs on a gray central stem. The entire effect is that of a very fine-foliaged fern which, in itself, is enough to justify growing the plant. The white flowers on four- to eight-inch stems are not particularly showy, but the short, thick pods following them are often attractively tinted with bronze and red.

SMILACINA (VAGNERA). False Solomon's-Seal.

The False Solomon's-Seals found in the West differ little in garden value from the common easterners. All are shade-loving plants with broad, parallel-veined leaves, usually clasping, and small terminal heads of green or yellowish flowers followed in due time by clusters of purple or red berries.

S. amplexicaulis and *S. racemosa*, with many small flowers, and *S. sessilifolia* and *S. stellata*, with fewer and larger flowers, are usually offered. They are useful to the same degree as other woodlanders of similar habits, to help fill the void usually present in coniferous shade, with green foliage and later with showy berries until the fruits are devoured by birds.

SPHÆRALCEA. Globe-Mallow.

The Globe-Mallows form a large group of somewhat coarse, leafy herbs, most of which are doubtfully hardy in northern gardens. Only one has proved itself entirely hardy with me, *S. munroana*, a plant ranging from the dry plains of British Columbia to Oregon and Utah. It is a semi-shrubby, flopping thing with minutely hairy, gray leaves which are

rounded heart-shape, more or less coarsely toothed and lobed. The clusters of small hollyhock blossoms in the leaf-axils are deep apricot or salmon to rose-red. In addition, usually a more or less noticeable terminal spike appears in which the leaves are entirely wanting or reduced to bracts. This plant is particularly valuable for dry walls and hot slopes where the flopping branches may display the unusual color-tones of the flowers to the best advantage. If perfectly happy, it blooms over a long period during July and August, another thing to commend it.

SPIRÆA.

Among the numerous shrubby Spireas in our territory are two small and compact enough to make good rock-garden subjects.

S. corymbosa is a shrub of the mountainsides, growing one to two feet high, with the usual Spirea foliage and flat-topped clusters of white flowers at the ends of the branches. In its dwarf forms it is a suitable shrub for larger rockeries.

S. densiflora is a pink-flowered edition of *S. corymbosa*, except that it varies in height from six inches to three to four feet. The dwarf forms from high elevations in the Cascades, where the species grows as a tiny, compact shrub with huge heads of pink flowers, have remained dwarf for me in the garden for several years. It is a fine thing for the rockery, not only when in bloom but for its fine, birch-like foliage as well. For *S. hendersoni* and *S. cæspitosa*, see Petrophytum.

SPRAGUEA. Pussy-Paws.

S. multiceps, or Pussy-Paws, is one of the neatest alpine plants. It consists of one to several crowns, each decorated with a flat rosette of thick, fleshy, evergreen leaves. On occasions, the under surface of the leaves is dull red to bronze, enough of the color crowding to the exposed upper parts to qualify the ground-hugging mass as a striking part of the alpine display. The flowers are carried in thickly crowded heads on prostrate or semi-prostrate stems, which extend in every direction from the foliage mass. The masses of soft pink, fluffy flowers give it its common name, and one singularly appropriate too, for those fluffy balls might well be pink kitten's paws scattered over the ground. While found in many parts of the West, Pussy-Paws are partial to the pumice slopes of the great volcanic peaks of the Cascades. Particularly on the Three Sisters, Mount Jefferson, and Mount Hood, acres of ground are sprinkled with these dainty plants. It was on the Sisters that I first saw them in endless profusion, intermingled with the last fading flowers of *Calochortus subalpinus* and the first blooms of *Pentstemon menziesii*. See page 235.

STREPTOPUS. Twisted-Stalk.

These are common, shade-loving plants with thin, clasping, ovate leaves and small greenish yellow or purplish flowers hung on twisted stems in the leaf-axils in such a manner as to be concealed by the leaves. This latter characteristic is particularly noticeable in the first species. Their principal value is to furnish

Tellima grandiflora, a graceful woodlander like a dainty heuchera. Photograph by C. L. Marshall

Viola cuneata has a most impish little flower-face
Photograph by the Author

Trillium sessile, a variable and attractive form of the Wake-Robin
Photograph by C. L. Marshall

Trillium ovatum, the western form of the eastern *T. grandiflorum*
Photograph by the Author

foliage in coniferous shade where few plants will thrive.

S. amplexifolius, with branched stems, white berries, strongly bent flower-stalks, and greenish yellow bells, and *S. roseus*, with simple stem, red berries, and rose-colored blossoms hung on almost straight stems, are common to wooded areas in much of the United States and Canada.

SYNTHIRIS. Spring Queen.

A race of appealing little scrophularids which are the earliest woodlanders to bloom in the spring. Consequently, they are better known to children than some of the more conspicuous summer bloomers. In the milder parts of the coast they are apt to show a few flowers all through the winter, coming into full beauty at the first warm days of March.

S. rotundifolia has long-stemmed, basal clusters of rounded leaves, crinkled and scalloped at the edge into rounded lobes. All through the winter, in western Oregon and Washington, its little flower-spikes peek through the ground, awaiting only the invitation of a few warm, sunny days to push up a three- or four-inch spike hung with tiny blue lilies-of-the-valley. Usually a single spike or two is the extent of the display in its native haunts, but few plants respond better to cultivation, old, established garden plants sending up spike after spike until one wonders how long it can continue. I have had plants displaying enough color to be very much in the garden picture from late January to early April. It increases

slowly by crown offsets on short rootstalks and, where happy, from seed. Illustrated on page 236. *S. rotundifolia sweetseri* is a name applied to a variety from the Siskiyous with somewhat longer leaves and much darker blue flowers.

S. reniformis from eastern Oregon and Washington has larger kidney-shaped leaves with sharply toothed lobes and larger spikes of small, deep blue, saucer-like flowers with sharply pointed petals.

An as yet unnamed form (soon to be described) from the Columbia Gorge, is the plant long sent out by many nurserymen and collectors as *S. reniformis*. It is a big, showy shade lover with six-inch spikes densely packed with dark blue flowers. The leaves are large, kidney-shaped, smooth, and shining green. It is, in fact, a glorified *S. reniformis* and has been confused with it by botanists. It is by far the best garden plant of the group and, like the others, is found in rocky, well-drained spots in the woodland. See page 236.

S. rubra is of no account. The flower-spikes look for all the world like a plantain stalk suddenly gone woolly, with straggling red hair. There is no corolla, the exserted anthers furnishing the red tint to the spikes.

TALINUM. Rock Pink.

T. spinescens, an exceedingly showy relative of the Lewisias from the Wenatchee Mountains of central Washington, sends out sprawling, branching, succulent stems ending in masses of linear leaves like long, fat fir needles. The rose-red blooms, filled with

a mass of bright yellow stamens, are carried in open panicles on naked stems of some five to six inches. In its native habitat the ends of the stems are covered with short spines which are nothing more than the persistent midribs of former leaves. In the wet winter climate of Portland these spines, too, disappear, leaving behind curiously naked-looking branches which call desert things to mind in some vague way. On the ends of these stems little red pimples appear in the spring, and these gradually expand themselves into clusters of slender succulent leaves which again decently clothe their nakedness.

TELLIMA. Fringe-Cup.

This is a western race of leafy, shade-loving members of the great Saxifrage family. *T. grandiflora*, *T. odorata*, and *T. racemosa*, the three common forms, are quite similar in garden value, being useful in a damp, shaded place for a ground-cover. The leaves are rounded-cordate on basal stems, and the dull pink or greenish white, ragged-edged cups are carried in simple racemes or spikes. *T. grandiflora* is illustrated on page 241.

THALICTRUM. Meadow-Rue.

While there are numerous Meadow-Rues in the West, none of them remotely approaches the beauty of the garden forms of *T. dipterocarpum* and *T. aquilegifolium*. The majority are entirely too robust for the rock-garden and belong more properly in the hardy border. They are all more or less valuable foliage-

plants for filling in a wild corner, and *T. alpinum*, an arctic and alpine bog species, is small and dainty but not showy. *T. occidentale* (possibly others), normally a rather tall species, becomes a quite compact and neat thing of some twelve to eighteen inches in poor soil and half shade. In such places it can be used to advantage, although there are other plants available for the same purpose with a better floral display.

THLASPI. Penny-Cress.

T. alpestre, a low-growing, white-flowered member of the Mustard family, is rather neat and attractive, but not a long-lived perennial. From its rosettes of spoon-shaped leaves come numerous short stems bearing little heads of white to pale purple crosses.

There are numerous others which are quite similar in character, good enough, but still nothing to rave about. *T. parviflorum*, *T. californicum*, and *T. nuttallii* are some of them. *T. coloradense* and *T. purpurascens* are names applied to lower-growing forms from the Rockies. None of the above is now in cultivation, and the names are given as an indication of what may be expected in this group.

TIARELLA. Coolwort. Foam-Flower.

Still another and, incidentally, among the best of the leafy Saxifrages are the Tiarellas, which bear lobed or divided foliage and numerous small white flowers in dainty racemes. Of the three western species occasionally available, *T. unifoliata*, common in the higher mountains from Alaska to California,

has simple, three- to five-lobed leaves; *T. laciniata* from Vancouver Island and western Washington, leaves divided into three leaflets, each in turn deeply cleft and lobed; *T. trifoliata*, three leaflets merely toothed. All grow about eighteen inches high, and have considerable value for naturalizing in the wilder parts of the garden.

TOFIELDIA. False Asphodel.

A slender perennial with creeping rootstalks, *T. intermedia* has a simple stem, leafy at the base, with narrow, grass-like leaves and little inconspicuous spikes of yellowish flowers. It is a common dweller of the bogs, and has no great garden value, though it is sometimes offered. *T. occidentalis* and *T. glutinosa* are similar.

TOWNSENDIA. Townsendia.

Many of the most beautiful of this gorgeous race of composites are biennial or, at best, short-lived perennials that bloom throughout the summer with a never-ending display of big white, rose, or occasionally purple asters, each on its own stem.

Their long season of bloom, while a most valuable garden quality, is often fatal to establishing them in cultivation. Those plants that survive the shock of moving promptly bloom themselves to exhaustion. Leaving the biennials out of consideration, there are few available for gardens at this time.

T. florifer is a real beauty with a basal mass of linear-oblanceolate leaves from which rise a profusion

of big pink asters on two- to six-inch stems, showing, at times, as many as twenty-five to thirty blossoms on a single plant. They are at their best in arid sections of Oregon and Idaho. This plant has been brought into cultivation many times, but it is a short-lived perennial and should be grown from seed whenever possible. This is by no means the easiest thing in the world to do, as seedlings of these desert composites have a most exasperating way of disappearing, even after they are safely through the ground. *T. exscapa*, from the Great Plains, is a dwarf perennial with huge white or pink flowers and gray leaves. *T. incana* from the Rockies is a beautifully silvered, canescent species with big lilac flowers. *T. wilcoxiana* is a royal beauty similar to *T. exscapa*, with big lavender blossoms on short stems. *T. rothrockii*, *T. intermedia*, *T. glabella*, *T. scapigera*, and *T. montana* are all good perennials for which it would be well to watch. While few or none of these are offered by dealers at the present time, the increasing interest in the cultivation of western wild flowers makes it probable that some of them will put in their appearance sooner or later.

TRIENTALIS. Star-Flower.

The Star-Flowers are dainty and attractive, but not particularly brilliant little woodlanders with the leaves gathered in a whorl at the summit of the stalk, above which little pink or white stars are balanced on short, wiry stems.

T. latifolia, the larger of the two, is found in the

lower country from Vancouver Island south, and *T. arctica*, from one to four inches high, is a bog-plant with white flowers and the leaves scattered along the stem. Both grow from small tubers and are easily established in shady places.

TRIFOLIUM. Clover.

T. megacephalum, which appropriately names itself as Big-Head Clover, is representative of a type that occasionally takes the eye of a wandering gardener. The plants hug the ground, with creeping stems clothed with leaves cleft into three, among which the superstitious might find an occasional "four-leaved Clover" to reward patient search. The big heads are dull red or a purplish hue, with only an occasional specimen bright enough to be really worth keeping.

The deep root-system offers the usual difficulties attendant on transplanting most members of this family, and for the majority of people the effect will scarcely be sufficiently remarkable to reward the trouble of establishing it. If really bright color-forms become available, it will be something else, as the comparatively huge blossoms against the tight packed masses of dark green leaves hint at garden possibilities.

This species is found in early spring in widely scattered localities in the Coast States.

TRILLIUM. Wake-Robin. Trillium.

Outstanding among American Trilliums is *T. rivale*, a tiny rock-dweller from the Siskiyous. It has the

usual whorl of three leaves and a nodding, short-stemmed flower, clear white and comparatively large. Often the whole plant does not exceed three inches in height. It is a dainty rock-plant and must be given good drainage and moraine conditions to be happy in the garden, where its elfin beauty is admirably suited to fill some choice pocket or crevice.

T. ovatum is an entirely different type. Its larger, upright flowers are carried above the whorl of three large leaves on short stems. The flowers are clear white on opening, gradually changing to wine-purple as they age. It is found from Colorado west to the coast. This and the next species are pictured on page 242.

T. sessile (also called *T. chloropetalum* and *T. californicum*) is the largest western species, with big, stemless flowers sitting atop the leaf-whorl. The blossoms vary from ivory-white to an atrocious, dark yellowish red in some parts of the California and Oregon coast. This change of color is not due to aging; the flowers are either red or white on opening and remain that way. Occasionally an attractive dark velvety red flower can be found, but the white form is much more beautiful. A faint odor, resembling freshly crushed grapes, is present in this species, adding to its attractiveness as a garden plant. *T. ovatum* and *T. sessile* are especially valuable for naturalizing in open woodland or for planting among shrubbery. When the flowers are not picked they increase in size and beauty each year.

T. petiolatum is an unattractive Trillium with three

Viola glabella, useful for naturalizing
Photograph by George C. Stephenson

Viola hallii, an outstanding species of the cut-leaved group
Photograph by the Author

Viola occidentalis, a big, white swamp Violet
Photograph by the Author

Xerophyllum tenax, a conspicuous western mountaineer
Photograph by George C. Stephenson

leaves set on long stalks. The small, dark red flowers have three narrow petals set close to the ground at the base of the three leafstalks. It is a curiosity of no garden value.

TROLLIUS. Globe-Flowers.

T. laxus, the only Globe-Flower available from our territory, can best be described as a white caltha with palmately lobed leaves. It grows in swampy places in wet meadows of the Olympics, Cascades, and Rockies, and, where abundant, its white flowers, each on its own stem, make a brave show.

VACCINIUM. Huckleberry.

The most beautiful of the Huckleberries, *V. ovatum*, now widely used as holiday greenery and shipped to the cities by the carload, is too tall for use in the rock-garden.

V. myrtillus from the high Cascades is a dwarf of some ten inches, with bright green, angled branches, narrow little light green leaves, and bright red berries. *V. cæspitosum* is also a dwarf with wider leaves, finely toothed on the edge, and blue berries. It is widely distributed through the higher ranges of the West.

Both are somewhat neat little shrubs that grow as ground-cover, particularly in lodge-pole pine forests where they find good drainage and more or less acid conditions. They have no outstanding garden value.

VAGNERA. False Solomon's-Seal.

These plants are treated under Smilacina.

VANCOUVERIA. Inside-out Flower. Barrenwort.

There are two of these dainty little plants, one of them in heavy fir and spruce forests and the other in southern Oregon and northern California.

V. hexandra, to take the more common first, is becoming widely used as a ground-cover in shady places and for planting with ferns and various dainty shade-loving bulbs in suitable parts of rock-gardens. It is ideal for this purpose as its thin, wiry roots do not interfere at all with bulbs, and the airy sprays of leaves, composed of small, six-sided leaflets, held aloft by equally airy stems, are most effective after the bulbs are gone. During the summer the curiously inverted tiny white flowers are borne well above the leaves in open panicles. Altogether it is one of the most satisfactory ground-cover plants for deep shade as it lacks the devastating vigor of asarum and some others put to similar use.

V. chrysantha is a plant of the open, rocky hillsides of southern Oregon and northern California. There it grows about the base of the manzanita and California lilac. Its leaves are thick, leathery, and almost evergreen, while the soft yellow flowers are larger and more conspicuous than *V. hexandra*. Both have a dainty, aristocratic bearing which commands respect and admiration.

VIOLA. Violet.

Western America is filled with an endless number of Violets, many of them differing in comparatively unimportant details. It is impossible to discuss or

outline the entire family in a book of this scope, and only a few outstanding species and those frequently offered are considered. Our Violas are of two distinctly different types for garden purposes—those with entire leaves and those with much-dissected and lobed foliage.

ENTIRE-LEAVED SPECIES

This group covers a multitude of Violets, many of them small and inconspicuous. It can be divided into blue-white and yellow-flowered species for discussion.

Of the blue-white group, *V. adunca*, so far, stands at the head of the class. In the rather poor, gravelly soil of my garden it makes compact clumps of thick, dark green leaves, above which dance dark blue Violets over a long period of time. No other native Violet so persistently carries its flowers above the foliage, and it is, therefore, by long odds the most showy of the blue race. In rich soil, *V. adunca* shows a tendency to become more leggy, after the fashion of many others, and the gardener who values compactness and neatness will govern himself accordingly. *V. adunca* has varied into numerous races in its wide range over much of the West, most of which persist in the same flowering habit.

For garden purposes, *V. flettii* is a particularly diminutive and attractive *V. adunca* from the high Olympics.

V. ocellata is very like common *V. canadensis* in habit, with heart-shaped, pointed, serrate leaves. The upper petals are white on the inner surface and

deep purple-brown on the outside, while the lower are yellow, veined with purple. The two lateral petals have a purple spot near the base of each.

V. howellii, a woodlander from the Cascades and Coast Ranges, has big, heart-shaped, serrate leaves and white to dark blue flowers on long stems. It much resembles the common eastern American woodland Violets and is useful in the same sort of places. *V. palustris* is a similar but more straggling blue or white Violet from swampy places.

V. cuneata is one of the most irresistibly impish flowers. From a rather large rootstalk, rambling on or near the surface of the ground, arise thick, leathery, dark green leaves. Intermingled with them are fat-faced white Violets with deep purple spots on either cheek, which achieve an amusing effect not present in many Violas. It comes from the wet hillsides of the Siskiyous, blooming in company with *Sisyrinchium grandiflorum*, *Lewisia oppositifolia* and other plants of similar nature. Illustrated on page 241.

Of the yellow-flowered species, *V. pedunculata*, the royal California beauty, stands preëminent. In fact, it is the chief rival of *V. pedata bicolor* for first rank in beauty among all American species. Its huge yellow pansies, with brownish reverse to the petals, are carried well above the foliage where they are displayed to best advantage. Its habit of forming deep, whip-like roots makes it somewhat difficult to transplant, but it is worth every effort.

V. nuttallii and *V. præmorsa* are much the same, if they are not, in fact, forms of the same plant. Both

have big, upstanding yellow blossoms among a mass of big, lanceolate, more or less hairy leaves and make a satisfactory contrast to blue-flowered forms naturalized in shaded and semi-shaded woodlands. *V. glabella* (see page 251) and *V. brooksii* are branching, yellow Violets with smooth, kidney-shaped leaves, and chiefly valuable for naturalizing. *V. sempervirens* is a little creeper with rounded, leathery, almost evergreen leaves and small yellow blooms. It is an abundant inhabitant of the dense fir and spruce forests of the Pacific coast, and will stand more shade than other species. It is often found in gardens as *V. sarmentosa*. *V. orbiculata* from the higher mountains of British Columbia, Idaho, and Alberta is much the same. A queer-looking Violet from the Siskiyous travels under the name of *V. lobata*. Its yellow blossoms are not particularly striking, but from a crawling underground rootstalk arise at intervals the strangest leaves in the Violet family. Big and leathery, some are entire and shaped like those of the tulip tree and others lobed as unevenly as those of a sassafras. It is found on dry, well-drained hillsides with *Phlox speciosa*, *Lilium bolanderi*, *Vancouveria chrysantha*, and others of the weird-looking assortment associated with the Siskiyou serpentines.

V. occidentalis is another oddity from the Siskiyous. It has long, narrow leaves, entirely unlike other Violet foliage, and good white blossoms. The sunny bogs filled with pitcher-plants are its preferred home, and gardeners should give it similar treatment. See page 252.

CUT-LEAVED SPECIES

The West has many variations to offer in this group. Most of them inhabit dry, open plains and plateaus, bloom early, and promptly become dormant. Nearly all die down to a short, pip-like rootstalk with a basal, circular rim of more or less permanent fibrous roots, and can be safely handled when in this condition. This trick of dying down to some such rootstalk is a favorite device of plants native to the semi-arid districts. Until gardeners learn to know and recognize this, there will always be difficulty in handling them in the regular florist trade, because of the immense amount of dissatisfaction with the dead appearance of the dormant roots on arrival.

V. pedatifida has big, pale blue flowers with small, bright orange centers, carried above the foliage. The leaves are three-parted and each part is again divided into linear lobes. It comes from the plains states at the eastern base of the Rockies, and for me has ranked next to *V. pedata* and *V. pedata bicolor* in showiness among the cut-leaved forms, to say nothing of the fact that it is one of the most easily grown of its type.

V. hallii should be instantly passed up by all gardeners who value flowers for size and brilliance of color alone, for it will hold no interest for a mind tuned to mere size. It is wee and dainty, beautifully colored, and well balanced. In addition, it is delightfully fragrant—one of the few cut-leaved species so blessed. Naturally growing in gravelly banks through most of western Oregon and northwestern California,

it retains all the dainty grace that makes it so captivating in its native home when grown in similar poor soil in gardens. Rich soils tend to make it leggy and too leafy, spoiling the entire effect. The flowers are odd little faces; the two upper petals dark velvety violet, and the lower three soft creamy yellow. Its leaves are finely divided into lacy little lobes. The entire plant is designed for a choice place in the gardens of those who appreciate daintiness and charm. It never blossoms profusely enough to furnish a mass effect, and will disappoint any attempt to make such use of it. Illustrated on page 251.

V. chrysantha (*V. douglasii*) grows in quite similar soils in the same general territory as the *V. hallii*. Its leaves are not so finely divided, but the somewhat larger flowers are rich golden yellow with a brownish purple reverse on the upper petals, making a most attractive effect.

V. trinervata and *V. beckwithii* are similar desert Violas with bicolored blossoms and a faint, elusive fragrance different from any others. They can readily be distinguished by the fact that *V. trinervata*, as its name implies, has three distinct parallel veins in each of the larger leaf-lobes, while *V. beckwithii* has only one. Both have proved rather difficult to flower in the garden, although it is comparatively easy to keep the plants alive. They do not equal the cut-leaved species previously discussed because of their smaller flowers, all too sparingly borne even in a native state.

V. sheltonii is the least valuable of this section

which is now available for garden purposes. The leaves are palmately cleft into a remarkably close resemblance to some dwarf delphiniums of the same region. The small, yellow flowers are like those of the majority of Violets. This species is usually found at the bases of bushes, running about with rather thin, anemic-looking rootstalks. It blooms only sparingly.

WYETHIA. Mule-Ears.

Very coarse, stout Sunflowers, borne several to a stem, with large leaves arranged alternately on the stalks and stout, thick taproots that resent disturbance. None has yet condescended to grow for me, and it is no great loss either, although plants are sometimes offered by western collectors. *W. angustifolia* and *W. helianthoides* are most common.

XEROPHYLLUM. Squaw-Grass.

X. tenax is one of the most striking mountain plants. Its great clubbed plumes of creamy white flowers, rising above the clump of tough, grass-like leaves, attract the attention of everyone. The plants often cover miles of mountainside, forming one of the most showy floral displays in the West. Bear-Grass, Squaw-Grass, Elk-Grass, Basket-Grass, and Pine-Grass are all names applied to this plant, though the first two seem to be most commonly used.

It is as difficult to grow and flower as it is beautiful, although in some gardens it is established and apparently happy. At its best in the Cascades, it grows indifferent to sun or shade, although it blooms better

in the open. It is able to grow in nearly all types of soil, but loves best the well-drained slopes and ridges. Spring planting seems to bring better results than moving in the autumn, but, as yet, no one can claim complete success with this well-distributed westerner. Illustrated on page 252.

ZYGADENUS. Death Camas.

A race of more or less poisonous, Camas-like bulbs with a few narrow leaves and small panicles of yellow to greenish yellow flowers.

Only *Z. fremontii*, from the coast of southern Oregon and northern California, is showy enough to be of any value. This produces umbels of large, pale yellow flowers with a darker center, that are quite as good as ornithogalums.

Z. venenosus, *Z. elegans*, and *Z. paniculatus* are sometimes offered, but they do not have charm enough to take up room in a garden when so many more beautiful things are available.

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